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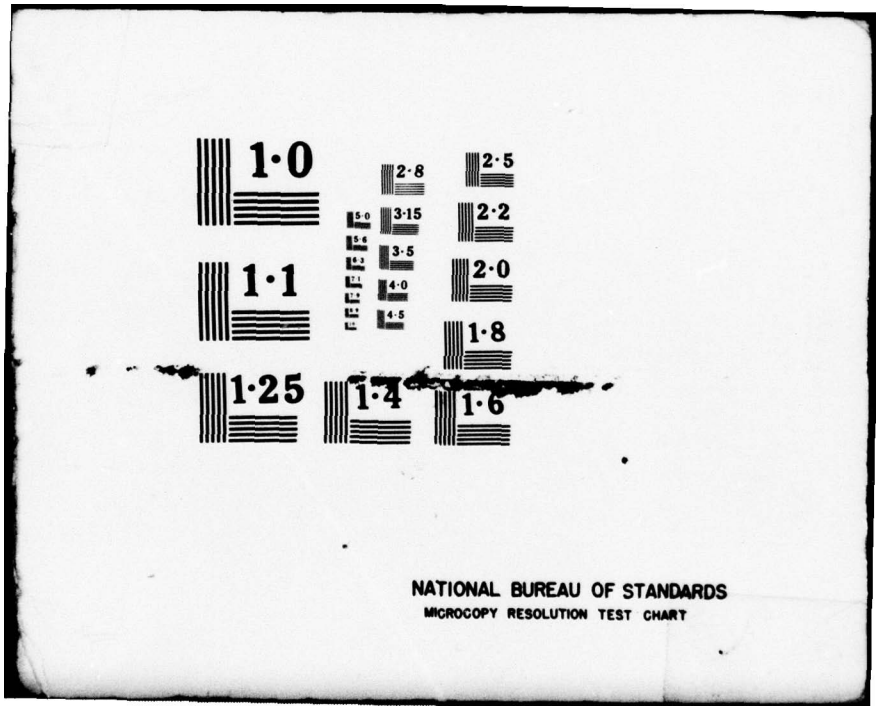
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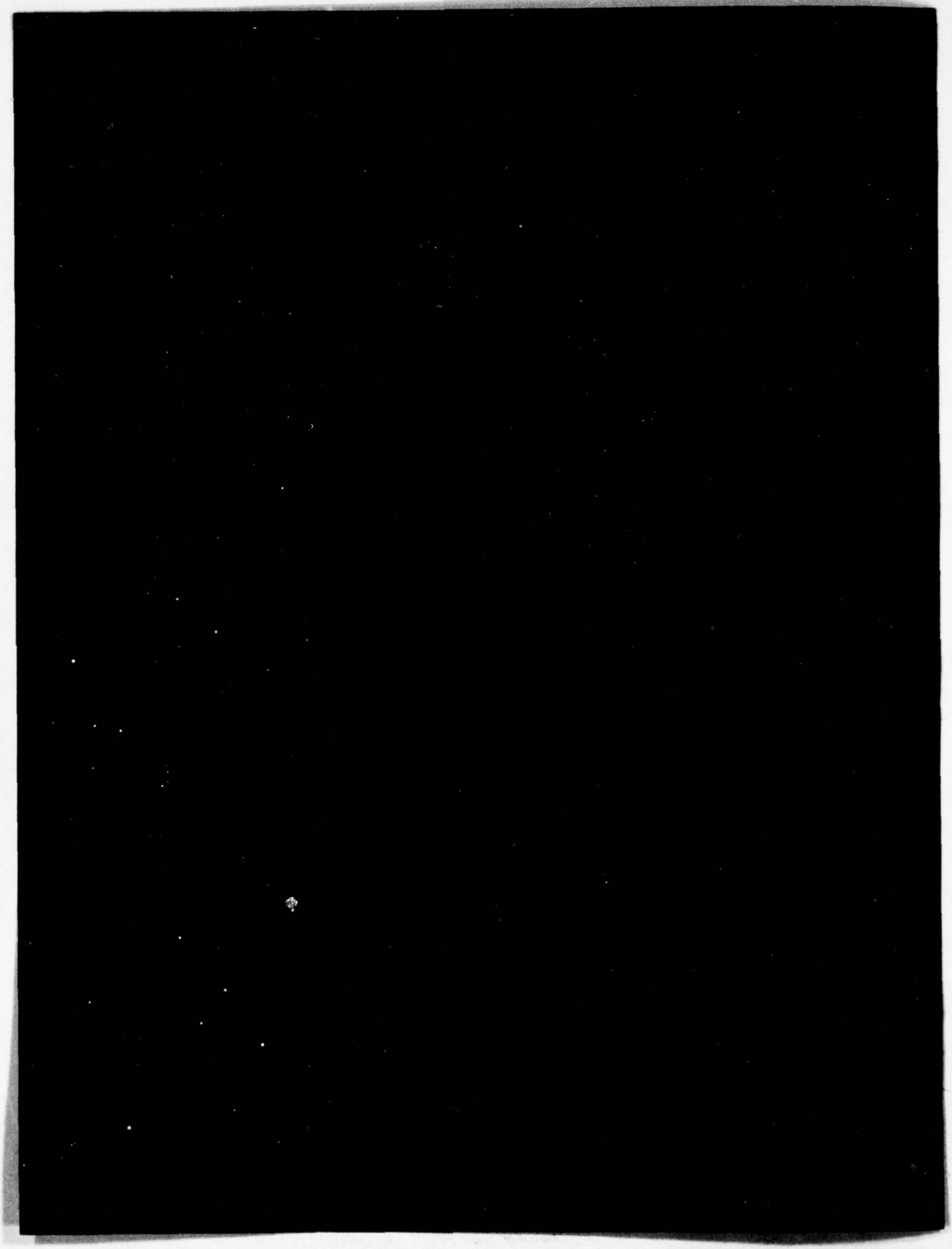

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The Depot Maintenance Planning and Programming System (DMPPS) is a large computer system developed over a period of two and a half years by the David W. Taylor Naval Ship Research and Development Center (DTNSRDC), Code 186 for the Naval Sea Systems Command (NAVSEA), Code 070T. The System was developed to project shipyard resource requirements (i.e., labor mandays and costs as

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well as material costs) by shipyard production shop and by ship work breakdown structure (SWBS). It enables management to assess the impact on the shipyards and ship systems of

- Changes in depot-level maintenance/alterations policy
- Major changes in force levels and/or composition
- Budgetary constraints

DMPPS consists of a network of interdependent computer programs written in FORTRAN IV. It was developed at DTNSRDC using the CDC 6000 series computers and was subsequently converted for the IBM 360/370 series computers. It is now installed and operational at the NAVSEA 070 computer terminal (which accesses an IBM 370/168 computer). This document presents the IBM 360/370 version of the DMPPS program modules. The modules have been grouped into six subsystems. Each of Volumes 2-7 of this document describes, in detail, one of these subsystems. An executive summary of the entire DMPPS is presented in Volume 1. The content of the seven volumes is indicated as follows:

Volume 1 - Executive Summary
Volume 2 - Preprocessor Subsystem
Volume 3 - Alterations Subsystem
Volume 4 - Repair Subsystem
Volume 5 - Synthesizer Subsystem
Volume 6 - Report Generator Subsystem
Volume 7 - Feedback Subsystem

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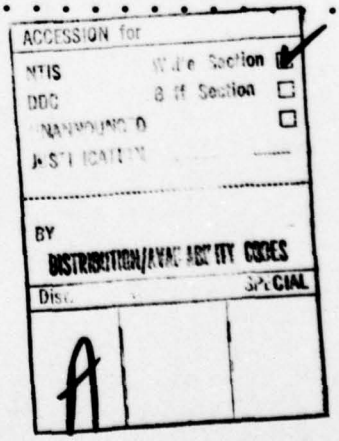

ABSTRACT

The Depot Maintenance Planning and Programming System (DMPPS) is a large computer system developed over a period of two and a half years by the David W. Taylor Naval Ship Research and Development Center (DTNSRDC), Code 186 for the Naval Sea Systems Command (NAVSEA), Code 070T. The System was developed to project shipyard resource requirements (i.e., labor mandays and costs as well as material costs) by shipyard production shop and by ship work breakdown structure (SWBS). It enables management to assess the impact on the shipyards and ship systems of

- Changes in depot-level maintenance/alterations policy
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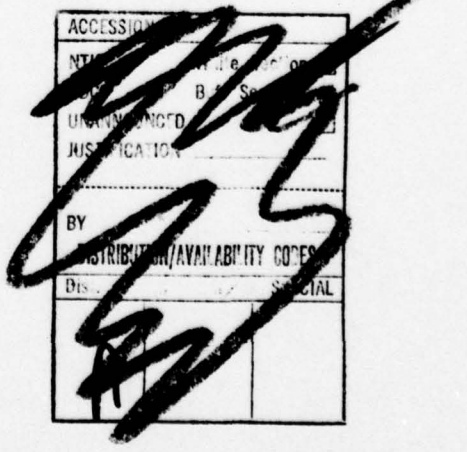

5. SYNTHESIZER SUBSYSTEM

The DMPPS (Depot Maintenance Programming and Planning System) consists of several separate modules which interface through various files. The Synthesizer module, using the program XPLODE, combines the appropriate repair and alterations matrices with estimates of direct labor mandays required for each availability from the Depot Maintenance Assignment File (DMAF) and produces a Shop File, a SWBS File, and a SWBS-Shop Matrix File. These files, which show the distribution of the projected workloads among the 9 single-digit SWBS categories and the 20 shops (19 production shop categories plus "other direct"), are used by the Report Generator Subsystem (Volume 6) to produce summary reports.

The DMAF used as input to the program XPLODE has been separated into four distinct files according to sector, and the records on the files have been sorted by shipyard. Sector assignments reflect the shipyard ownership and coastal location (e.g., Navy east, private west). Each file has a header record giving the order of the shipyards on the file. All availabilities on DMAF have been assigned an alterations matrix number and a repair matrix number. The matrices themselves are stored on a random access file (the Repair and Alterations Matrix File) with the matrix number as the access key.

Other modules of DMPPS develop the Matrix File and categorize the matrices with respect to the nature of the work they represent. A ship availability matrix shows, by SWBS and by shop, the fraction of the total direct labor mandays expended in each category. Thus, as each availability on DMAF is read, the program XPLODE multiplies the adjusted mandays by the appropriate repair and alterations matrix values and writes a record of data for both the SWBS File and the Shop File.

The SWBS File and the Shop File are created only once as all information is available for producing any type of report. The SWBS-Shop Matrix File is prepared for selected shipyards. If a yard has been selected to be "exploded," this file is processed and will produce 21 records of data for each availability. Since the creation of a SWBS-Shop Matrix File may result in massive output, it is necessary to specify the yards to be processed.

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The reports can then be generated by the program REPMAT (Volume 6 -- Report Generator Subsystem) and the process repeated for additional yards.

Input cards control which files are to be created and the yards that are to be processed or "exploded." If the program XPLODE is rerun to create additional SWBS-Shop Matrix Files, that portion of the program used to create the basic files is omitted.

The Report Generator Subsystem collects related bits of information from files created by the Synthesizer Subsystem and produces summary reports.

5.1 PROGRAM XPLODE

5.1.1 DESCRIPTION

The purpose of the program XPLODE is to create files that can be used to produce summary reports. XPLODE combines the Depot Maintenance Assignment Files, Version 4 (DMAF-4), and the Repair and Alterations Matrix File, and produces a SWBS (Ship Work Breakdown Structure) File, a Shop File, and a SWBS-Shop Matrix File. These files contain a total direct manday package for repairs and for alterations for each DMAF record, and are used as input to the programs PREWBS, REPSHOP, and REPMAT, respectively, as shown in Figure 5.1-1.

DMAF-4 is a version of the Depot Maintenance Assignment File which has been separated into four sectors. Sector assignments reflect the shipyard ownership and coastal location (Navy east, private west, etc.). There are four DMAF-4 Files, each having a header record designating the sector and the yards it contains, followed by a record of all "9's". Figure 5.1-2 gives an example of the format.

Each ship availability on DMAF has been assigned a repair and an alterations matrix number. The Repair and Alterations Matrix File is a random access file and each matrix is stored as a single record with the matrix number as the access key. The first 1500 records are reserved for alterations matrices and the next 1500 are reserved for repair matrices.

Subroutine RDMTRX is called to "read" from the Matrix File, the values for the repair matrix and the alterations matrix for a given ship availability. These matrices are stored in arrays dimensioned 10 by 21 where the first subscript corresponds to a single-digit SWBS element and the second subscript refers to the shipyard production shop category (the 19 shop categories and all "other direct" work will be referred to as the 20 shops throughout this report). The matrix entries represent the fraction of total direct labor for the particular SWBS element and shop indicated by the subscript. With these matrix entries, the program XPLODE is able to spread the mandays specified on DMAF-4 across the 20 shops and 9 SWBS categories.

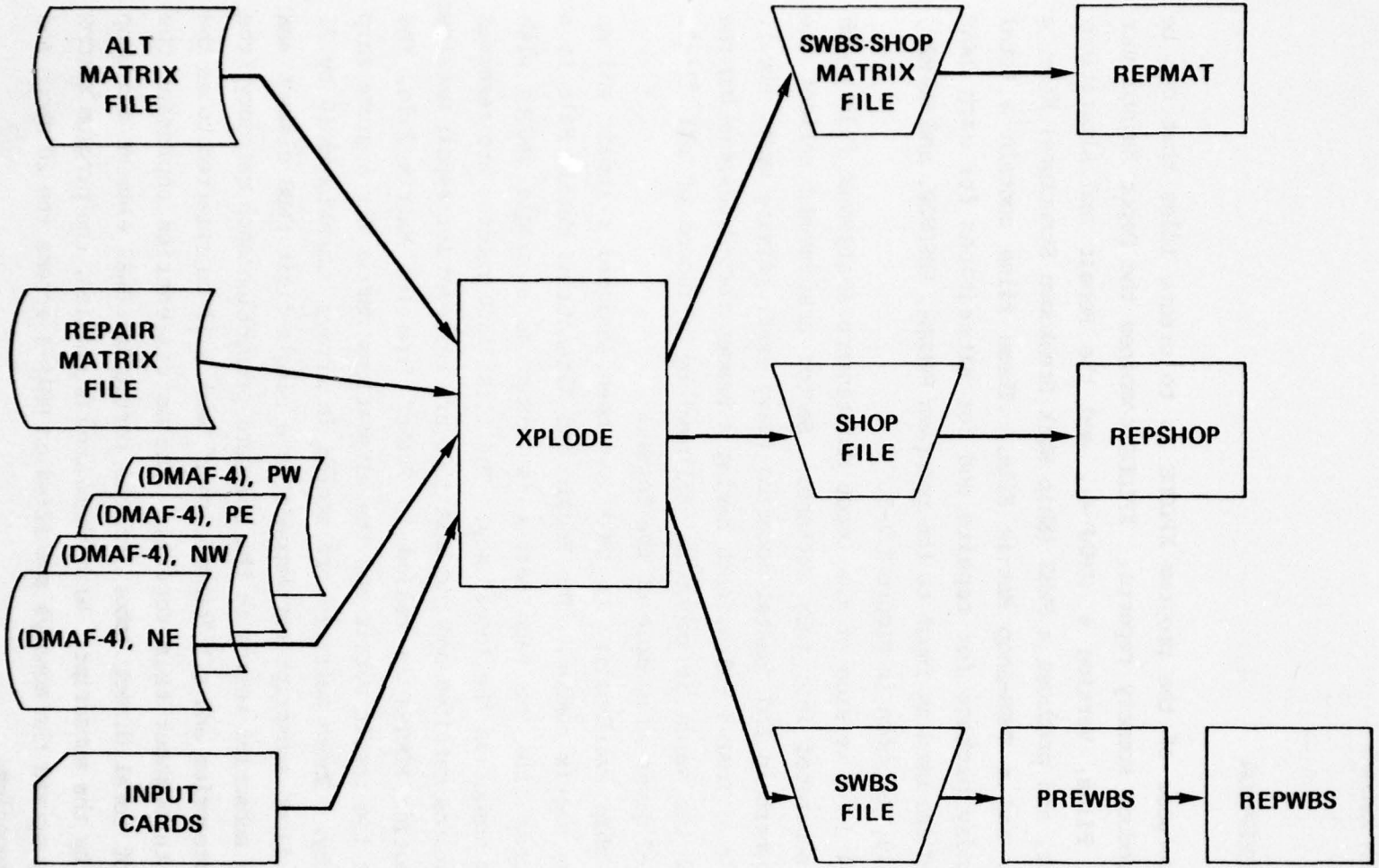

Figure 5.1-1 - System Diagram

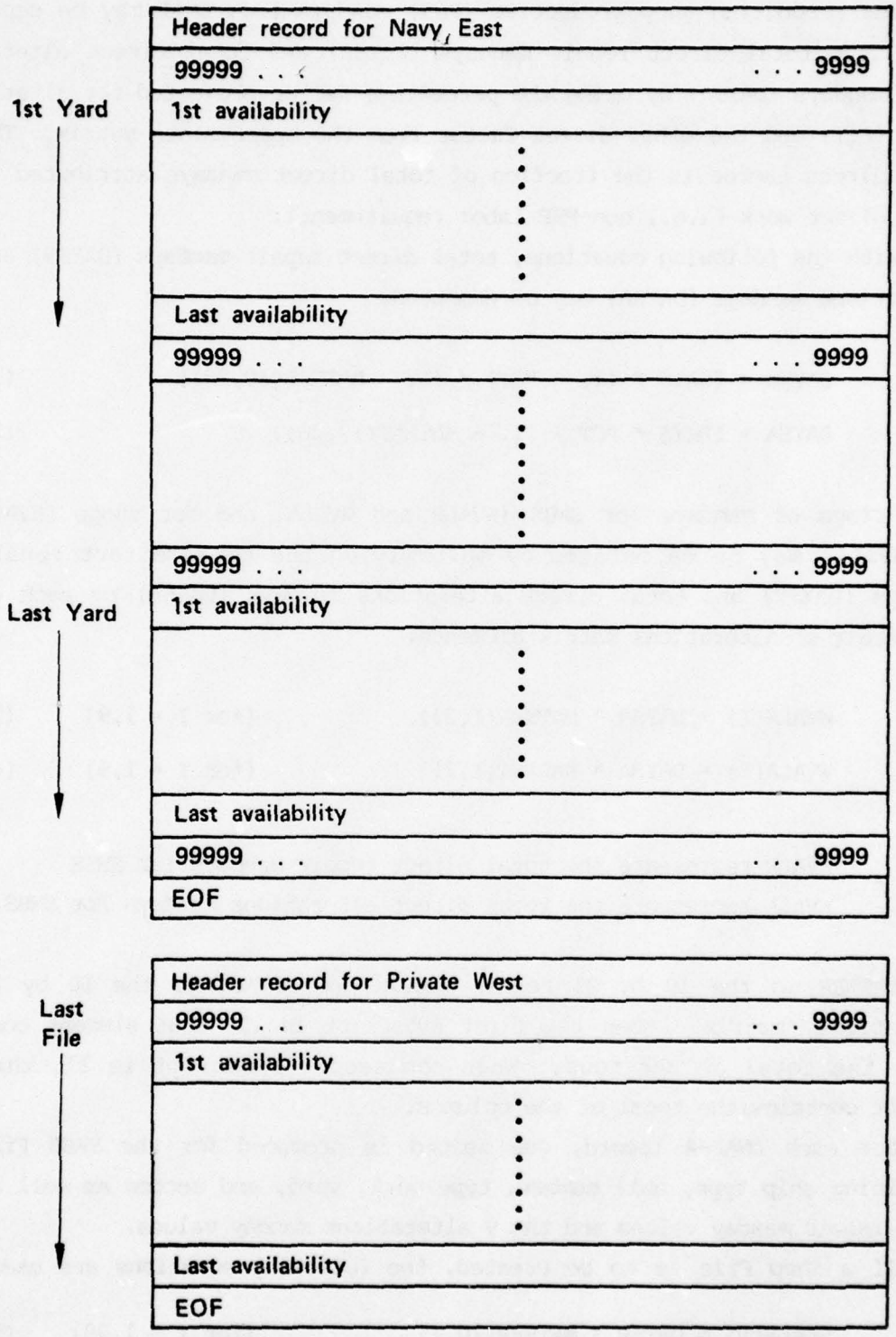

Figure 5.1-2 - Sample DMAF-4 Format

The production shop productive (PSP) mandays from DMAF may be separated into total direct repair mandays (DAYSR) and total direct alterations mandays (DAYSA) by using the percentage factor projected for alterations (PCT) and the other direct factor from the appropriate matrix. The other direct factor is the fraction of total direct mandays attributed to other direct work (i.e., non-PSP labor requirement).

With the following equations, total direct repair mandays (DAYSR) and alterations mandays (DAYSA) may be computed:

$$DAYSR = IDAYS * (1. - PCT) / (1. - MATREP(10,20)) \quad (1)$$

$$DAYSA = IDAYS * PCT / (1. - MATALT(10,20)) \quad (2)$$

Arrays of mandays for SWBS (WVALR and WVALA) and for shops (SVALR and SVALA) may be calculated by multiplying the total direct repair mandays (DAYSR) and total direct alterations mandays (DAYSA) by each of the repair or alterations matrix elements.

$$WVALR(I) = DAYSR * MATREP(I,21) \quad (for\ I = 1,9) \quad (3)$$

$$WVALA(I) = DAYSA * MATALT(I,21) \quad (for\ I = 1,9) \quad (4)$$

where

WVALR represents the total direct repair mandays for SWBS
WVALA represents the total direct alterations mandays for SWBS

MATREP is the 10 by 21 repair matrix and MATALT is the 10 by 21 alterations matrix. When the first subscript is 10, that element contains the total of the rows. When the second subscript is 21, that element contains the total of the columns.

For each DMAF-4 record, one record is produced for the SWBS File containing ship type, hull number, type work, yard, and sector as well as the 9 repair manday values and the 9 alterations manday values.

If a Shop File is to be created, the following equations are used:

$$SVALR(I) = DAYSR * MATREP(10,I) \quad (for\ I = 1,20) \quad (5)$$

$$SVALA(I) = DAYSA * MATALT(10,I) \quad (for\ I = 1,20) \quad (6)$$

where

SVALR represents the total direct repair mandays for shops (7)

SVALA represents the total direct alterations mandays for shops (8)

For each record of DMAF-4, a record similar to the SWBS record is produced. It contains the 20 repair manday values and the 20 alterations manday values projected for shops. No Shop File is created for private yards.

In addition to the Shop File and SWBS File, a SWBS-Shop Matrix File may be created for designated shipyards. This file consists of one record for each shop within the shipyard showing the mandays which that shop will expend in each of nine SWBS categories. For each DMAF record, 21 records are produced - a record of zeros followed by 20 shop records. A format for the SWBS-Shop Matrix File is shown in Figure 5.1-3. Since this file could result in a tremendous amount of output data, only two or three yards should be selected for "exploding." The necessary report is generated with the program REPMAT. The total direct mandays for repairs (XVALR) are computed using the following equation:

$$XVALR(I,II) = DAYSR * MATREP(I,II) \quad (\text{for } I = 1,9 \text{ and } II = 1,20) \quad (9)$$

The total direct mandays for alterations (XVALA) are computed using the following equation:

$$XVALA(I,II) = DAYSA * MATALT(I,II) \quad (\text{for } I = 1,9 \text{ and } II = 1,20) \quad (10)$$

The SWBS-Shop Matrix File may be created for alterations, for repairs, or for a total of alterations and repairs.

The first input card contains identifying information and the option of creating the SWBS File and the Shop File. The next cards select the yards to be "exploded" and indicate whether the manday package is to be projected for repairs or alterations. A card containing the word "LAST" in the yard name field terminates the input card deck.

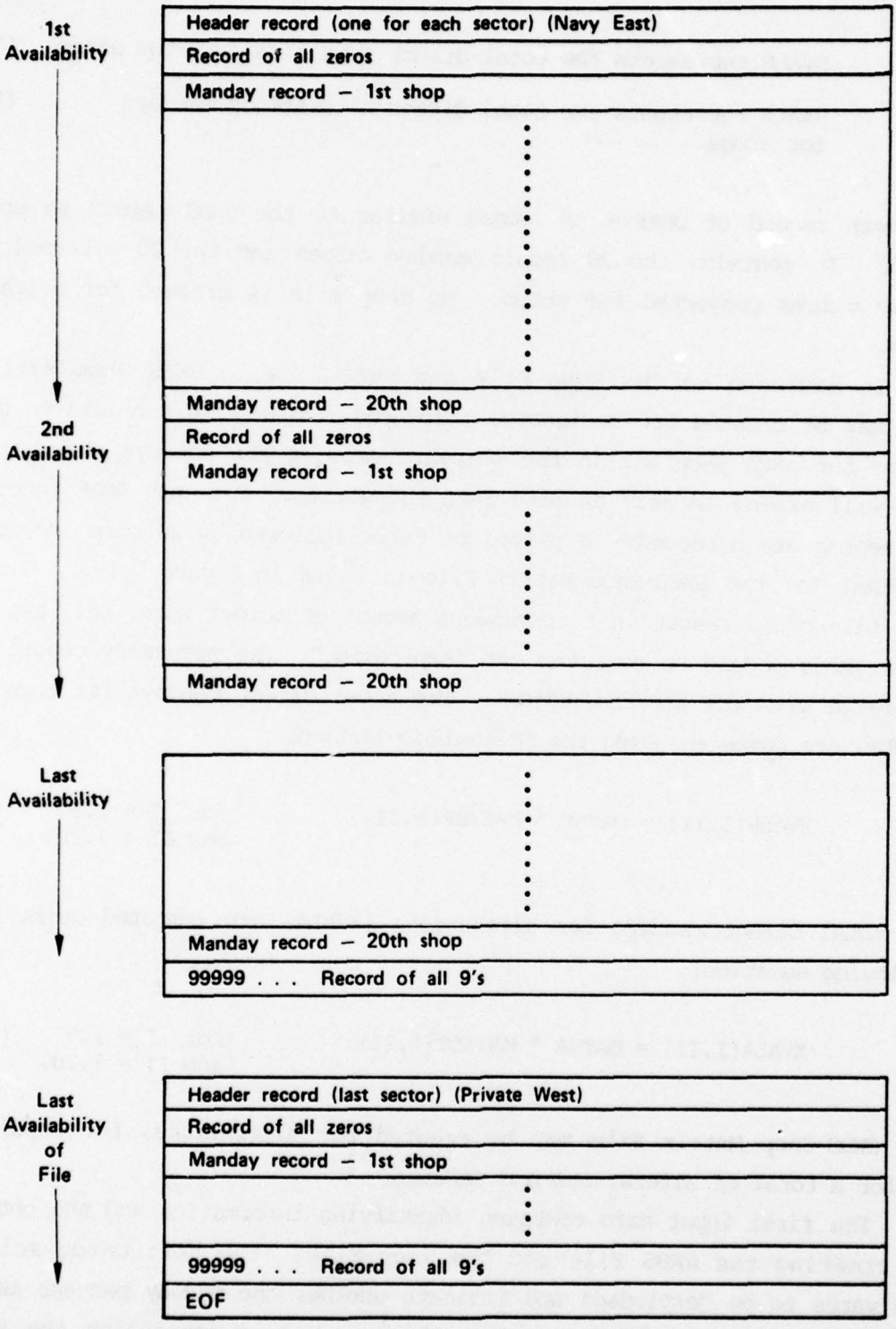

Figure 5.1-3 - SWBS-Shop Matrix File Format

If none of the required yards appear on a sector header record of DMAF, the "explode" portion of the program is bypassed. When an end-of-file mark is encountered on DMAF, the unit number is incremented and transfer is made to that portion of the program that reads the next sector header record. The order of processing of the sectors is NE, NW, PE, and PW, but yards selected for explosion may be input in any order. Figure 5.1-4 presents a hierarchical diagram of program XPLODE.

Main Program

The main program of XPLODE is responsible for combining the Depot Maintenance Assignment File, Version 4 (DMAF-4), and the Repair and Alterations Matrix File to produce a SWBS File, a Shop File and a SWBS-Shop Matrix File. As input cards are read, flags are set that note which files are to be produced and whether or not any optional debug printout is desired. For a SWBS File or a Shop File, the first 20 records may be printed. The SWBS-Shop Matrix File produces hardcopy output for only five availabilities, as one availability will "explode" into 21 records.

Subroutine IERROR

The subroutine IERROR is called when there are inconsistencies in the data. An error message is written and steps are taken to continue calculations. If the error is due to a missing or non-existent matrix, the values of the matrix are set to zero and processing proceeds. Errors resulting from omission of the options for "explosion" of a yard result in calculation of the total of repairs and alterations.

Subroutine RDMTRX

The subroutine RDMTRX reads the random access file containing repair and alterations matrices. The argument list transfers the repair matrix number and alterations matrix number from the main program and returns the corresponding matrix values. Tests are made to insure the alterations matrix numbers are between 0 and 1500 and the repair matrix numbers between 1500 and 3000. If a ship availability has not been assigned a matrix number, values of zero are used with the appropriate error message.

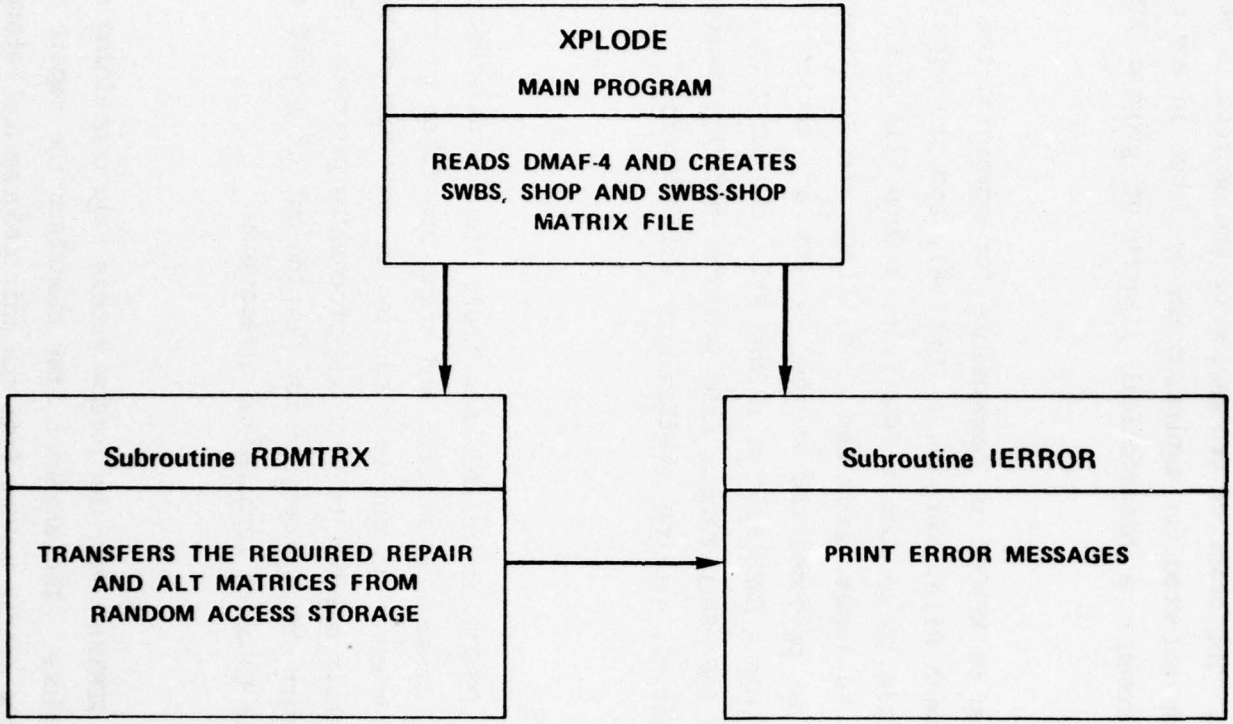

Figure 5.1-4 - Hierarchical Diagram of XPLODE

5.1.2 RUN SET-UP

The following set-up is used to run the XPLODE program on the IBM 360/370 computer:

```
//NVSXPLD  JOB  (XXXXXXXXX,XXXXX),USER,CLASS=B,TIME=(,20),MSGLEVEL=1
//JOBLIB DD DSN=NVS01.DEPOT.LIB,DISP=SHR
// EXEC PGM=XPLODE
//GO.FT05F001 DD *
```

XPLODE card inputs (unit 5)

```
//GO.FT06F001 DD SYSOUT=A                                          (ERROR MESSAGES)
//GO.FT08F001 DD DSN=NVS01.MATRIX.EXPLODE.DATA,DISP=SHR    (SWBS-SHOP FILE)
//GO.FT09F001 DD DSN=NVS01.MATRICES.DATA,DISP=(OLD,KEEP),     (MATRIX FILE)
//  UNIT=STORAGE,VOLUME=(PRIVATE,RETAIN,SER=999056)
//GO.FT10F001 DD DSN=NVS01.SWBS.EXPLODE.DATA,DISP=SHR          (SWBS FILE)
//GO.FT11F001 DD DSN=NVS01.SHOP.EXPLODE.DATA,DISP=SHR          (SHOP FILE)
//GO.FT12F001 DD DSN=NVS01.DMAF4.NE.DATA,DISP=SHR                (DMAF-NE)
//GO.FT13F001 DD DSN=NVS01.DMAF4.NW.DATA,DISP=SHR                (DMAF-NW)
//GO.FT14F001 DD DSN=NVS01.DMAF4.PE.DATA,DISP=SHR                (DMAF-PE)
//GO.FT15F001 DD DSN=NVS01.DMAF4.PW.DATA,DISP=SHR                (DMAF-PW)
```

5.1.3 PROGRAM INPUTS

Card inputs are made using unit 5. Section 5.1.3.1 shows the format for the input cards.

Unit 5 - Card inputs which (1) give identifying report information and file options, (2) give yards to be "exploded".

The following additional units are used to input information from disk files previously created by other programs:

Unit 9 - Repair and Alterations Matrix File

Unit 12 - Depot Maintenance Assignment File, Version 4 (DMAF-4), NE

Unit 13 - Depot Maintenance Assignment File, Version 4 (DMAF-4), NW

Unit 14 - Depot Maintenance Assignment File, Version 4 (DMAF-4), PE

Unit 15 - Depot Maintenance Assignment File, Version 4 (DMAF-4), PW

The formats for these files are given in Sections 5.1.3.2. through 5.1.3.3.

5.1.3.1 Unit 5 - Card Inputs

Identification Card. This card must be the first card in the input deck.

Variable Name	Description	Field	Format
DATE(1-3)	Date (mo/dy/yr)	1-12	3A4
KIND	Option for type of output files W - SWBS only S - Shops only B - Both SWBS and Shops Δ - Neither	15	A1
COMMNT(1-5)	Run identification	20-39	5A4
IBUGS	Print option for Shop File	78	I1
IBUGW	Print option for SWBS File	79	I1
IBUGE	Print option for SWBS-Shop Matrix File	80	I1

Yard Cards. These cards are used to indicate which yards are to be "exploded" amd may be omitted if no SWBS-Shop Matrix File is to be created.

Variable Name	Description	Field	Format
IYDSEL	Name of yard to be "exploded"	1-5	A5
IOPT	Option flag for type of "explosion" R - Repairs mandays A - Alterations mandays T - Total of repairs and alterations mandays	8	A1

Terminator Card. This card must be the last card in the input deck.

Variable Name	Description	Field	Format
LAST	Terminator of input data - "LAST " in columns 1 through 5	1-5	A5

5.1.3.2 Unit 9 - Repair and Alterations Matrix File

The Repair and Alterations Matrix File is a random access file which contains both repair and alterations matrices. Each record on the file contains all the elements of one matrix and is accessed by the matrix number. The first 1500 records are reserved for alterations matrices and the next 1500 records contain repair matrices. Each alteration record is organized as follows:

Variable Name	Description	Field	Format*
MATNOA	Alterations matrix number	Access Key	(I4)
MATALT(1,1)	Alterations matrix entry for SWBS 1 and Shop 06 (the first shop)	1	(F6.4)
MATALT(2,1)	Alterations matrix entry for SWBS 2, shop 06	2	(F6.4)
⋮	⋮	⋮	⋮
MATALT(10,21)	Sum of all alterations matrix entries (=1.0)	210	(F6.4)

Each repair record is organized as follows:

Variable Name	Description	Field	Format*
MATNOR	Repair matrix number	Access Key	(I4)
MATREP(1,1)	Repair matrix entry for SWBS 1 and shop 06	1	(F6.4)
⋮	⋮	⋮	⋮
MATREP(10,21)	Sum of all repair matrix entries	210	(F6.4)

*The format is given for reference only. Since the file is a random access file, formats are not used in reading the variables from the file.

5.1.3.3 Units 12-15 - Depot Maintenance Assignment File, Version 4 (DMAF-4)

The program DMERGE (Volume 4) separates DMAF-3 into four separate files according to sector. It adds a header record to each file and these files represent DMAF, Version 4. They are defined as:

Depot Maintenance Assignment File (DMAF-4), NE
Depot Maintenance Assignment File (DMAF-4), NW
Depot Maintenance Assignment File (DMAF-4), PE
Depot Maintenance Assignment File (DMAF-4), PW

Each DMAF-4 file contains information describing all depot maintenance ships availabilities scheduled for yard-work at both Navy and privately owned shipyards during the selected five-fiscal-year period for a given sector. Depot maintenance availabilities are those availabilities with a type of work other than Fitting Out (FO), Post Shakedown (PS), or New Construction (NC).

Each semi-annual period of a fiscal year within which an availability falls corresponds to a record on DMAF-4. Note that there may be more than one DMAF record for any particular availability.

Each of the DMAF-4 files is sorted in ascending order by the following parameters:

- Yard
- Ship type
- Hull number
- Availability start date (year, month, day)
- Fiscal year (this record)
- Period (this record)

The format of each header record on the four DMAF-4 files is as follows:

Variable Name	Description	Field	Format
OWN	Yard ownership indicator	1	A1
COAST	Coast	2	A1
IYEAR	First fiscal year of LRPS projection	3-4	I2
IYARD(1-13)	Array of yard names contained in a given sector	6-70	13A5

Each semi-annual period of an availability is described by a record as follows:

Variable Name	Description	Field	Format
IYD	Yard	1-5	A5
ISHULL	Ship type-hull number	13	A8
ISEQ	Sequence number	14-17	I4
ICONT	Continuation indicator	18	A1
ITYPWK	Type work	19-21	A3
ISTRT	Availability start date (mo/dy/yr)	22-27	I6
IEND	Availability end date (mo/dy/yr)	28-33	I6
ISPEC	Specialization category	34-36	A3
OWN	Yard ownership indicator	37	A1
COAST	Coast	38	A1
IFYR	Fiscal year (this record)	39-40	I2
IPERD	Period (this record)	41	I1
IDAYS	Production shop productive (PSP) mandays this period	42-48	I7
ITDAYS	Total PSP mandays	49-55	I7
MATNOR	Repair matrix number	56-59	I4
MATNOA	Alterations matrix number	60-63	I4

Variable Name	Description	Field	Format
IPERCT	Percent of PSP mandays for alterations	64-66	I3
ICRV	Labor distribution histogram number	67-68	I2
IREC	Record number	85-90	I6

Figure 5.1-2 shows the sample format of the DMAF file.

5.1.4 PROGRAM OUTPUTS

The following unit is used by XPLODE for generating hardcopy output:

Unit 6 - Error messages

XPLODE uses the following additional units to store information on disk for use by subsequent programs:

Unit 8 - SWBS-Shop Matrix File
Unit 10 - SWBS File
Unit 11 - Shop File.

The formats for these files are given in Sections 5.1.4.1 through 5.1.4.3.

5.1.4.1 Unit 8 - SWBS-Shop Matrix File

The SWBS-Shop Matrix File is a binary file so the format is given only as a guide to the size of the variables.

Header record. The format for the header record is described below. The arrays of yards and their options are dimensioned for 13.

Variable Name	Description	Position	Format
OWN	Yard ownership indicator	1	(A1)
COAST	Coast	2	(A1)
IYEAR	First fiscal year of LRPS projection	3	(I2)
IYDSEC(1)	Yard name	4	(A5)
IOPTS(1)	Option flag	5	(A1)
IYDSEC(2)	Yard name	6	(A5)
IOPTS(2)	Option Flag	7	(A1)
.	.	.	.
.	.	.	.
.	.	.	.
IYDSEC(13)	Yard Name	28	(A5)
IOPTS(13)	Option flag	29	(A1)

Manday Record. There is one Manday Record for each of the 20 shops for each six-month period of an availability.

Variable Name	Description	Position	Format
ISHULL	Ship type-hull number	1	(A8)
ITYPWK	Type work	2	(A3)
IYD	Yard	3	(A5)
IGROUP	Group number	4	(I3)
IFYR	Fiscal year (this record)	5	(I2)
OWN	Yard ownership indicator	6	(A1)
COAST	Coast	7	(A1)
IPERD	Period (this record)	8	(I1)
ICONT	Continuation indicator	9	(A1)
ISTRT	Availability start date (mo/dy/yr)	10	(I6)
IEND	Availability end date (mo/dy/yr)	11	(I6)
ISPEC	Specialization category	12	(A3)
VALUES(1-9)	Mandays for SWBS for this Shop	13-21	(9F10.2)
ISHOP	Index used to identify the shop number	22	(I2)

Figure 5.1-3 shows an example of a SWBS-Shop Matrix File.

5.1.4.2 Unit 10 - SWBS File

The SWBS File produces one record for each DMAF record. Each record contains the total repair mandays and total alteration mandays for SWBS. There are no header, separator or trailer records.

Variable Name	Description	Position	Format
ISHULL	Ship type-hull number	1	(A8)
ITYPWK	Type Work	2	(A3)
IYD	Yard	3	(A5)
IGROUP	Group number	4	(I3)
IFYR	Fiscal year (this record)	5	(I2)
OWN	Yard ownership indicator	6	(A1)
COAST	Coast	7	(A1)
IPERD	Period (this record)	8	(I1)
ICONT	Continuation indicator	9	(A1)
ISTRT	Availability start date (mo/dy/yr)	10	(I6)
IEND	Availability end date (mo/dy/yr)	11	(I6)
ISPEC	Specialization category	12	(A3)
WVALR(1-9)	Total direct repair mandays for SWBS	13-21	(9F10.2)
WVALA(1-9)	Total direct alteration mandays for SWBS	22-30	(9F10.2)
MATREP(10,20)	Fraction of total direct repair mandays required for "other direct"	31	(F10.6)
MATALT(10,20)	Fraction of total direct alterations mandays required for "other direct"	32	(F10.6)

5.1.4.3 Unit 11 - Shop File

The Shop File is created for Navy yards only and contains the total direct repair mandays and total direct alteration mandays for shops.

Variable Name	Description	Position	Format
ISHULL	Ship type-hull number	1	(A8)
ITYPWK	Type work	2	(A3)
IYD	Yard	3	(A5)
IGROUP	Group number	4	(I3)
IFYR	Fiscal year (this record)	5	(I2)
OWN	Yard ownership indicator	6	(A1)
COAST	Coast	7	(A1)
IPERD	Period (this record)	8	(A1)
ICONT	Continuation indicator	9	(A1)
ISTRT	Availability start date (mo/dy/yr)	10	(I6)
IEND	Availability end date (mo/dy/yr)	11	(I6)
ISPEC	Specialization category	12	(A3)
SVALR(1-20)	Total direct repair mandays for each of the 20 shops	13-32	(20F10.2)
SVALA(1-20)	Total direct alterations mandays for each of the 20 shops	33-52	(20F10.2)
IDAYS	PSP mandays for this period	53	(I7)
IPERCT	Percent of PSP mandays for alterations	54	(I3)

5.1.5 PROGRAM LISTING

```
C*****PROGRAM XPLODE(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE8,TAPE9,  ****  10
C****1  TAPE10,TAPE11,TAPE12,TAPE13,TAPE14,TAPE15)                       ****  20
C                                                                        XPLD  30
C         PROGRAMMER JEAN ST LAURENT - DTNSRDC - CODE 1863               XPLD  40
C         WRITTEN AUGUST 1976                                            XPLD  45
C                                                                        XPLD  50
C         PROGRAM XPLODE USES DMAF4 AS INPUT AND CREATES A WBS FILE      XPLD  60
C           AND A SHOP FILE                                              XPLD  70
C         THESE FILES GIVE TOTAL DIRECT MANDAYS FOR REPAIRS AND FOR ALTS XPLD  80
C         IN ADDITION, ONE OR MORE YARDS MAY BE EXPLODED                 XPLD  90
C         THE EXPLODED FILES CAN BE CREATED FOR ALTS, FOR REPAIRS        XPLD 100
C           OR FOR A TOTAL OF REPAIRS AND ALTS                           XPLD 110
C                 (BUT NOT ALL THREE)                                    XPLD 120
C         THESE OPTIONS ARE INPUT AS                                     XPLD 130
C               A  - ALTS, ONLY                                          XPLD 140
C               R  - REPAIRS, ONLY                                       XPLD 150
C               T  - TOTAL OF ALTS AND REPAIRS                           XPLD 160
C         THE OPTION IS INPUT WITH THE NAME OF THE YARD TO BE EXPLODED   XPLD 165
C                                                                        XPLD 166
C         A HEADER CARD CONTAINS REPORT IDENTIFICATION INFORMATION       XPLD 167
C           AND THE TYPE OF FILES REQUIRED                               XPLD 168
C         INPUTS FOR THE FILES ARE                                       XPLD 170
C               W - WBS, ONLY                                            XPLD 180
C               S - SHOP, ONLY                                           XPLD 190
C               B - BOTH WBS AND SHOP                                    XPLD 200
C               BLANK - NO ADDITIONAL FILES                              XPLD 210
C                                                                        XPLD 220
C               ASSIGNMENT OF FILES                                      XPLD 230
C         ---------------------------------------                        XPLD 240
C         TAPE5 - CARDS - INPUT                                          XPLD 250
C         TAPE6 - ERROR PRINTOUTS - OUTPUT                               XPLD 260
C         TAPE8 - XPLOSION FILE - OUTPUT                                 XPLD 270
C         TAPE9 - MATRIX FILE FROM DEVICE SET - INPUT                    XPLD 280
C         TAPE10 - WBS FILE - OUTPUT                                     XPLD 290
C         TAPE11 - SHOP FILE - OUTPUT                                    XPLD 300
C           DMAF ASSIGNMENTS                                             XPLD 310
C         TAPE12 - DMAF FOR NE - INPUT                                   XPLD 320
C         TAPE13 - DMAF FOR NW - INPUT                                   XPLD 330
C         TAPE14 - DMAF FOR PE - INPUT                                   XPLD 340
C         TAPE15 - DMAF FOR PW - INPUT                                   XPLD 350
C         ---------------------------------------                        XPLD 360
C                                                                        XPLD 370
      DIMENSION IYDSEL(20), IYARD(13), IOPT(20),                         XPLD 380
     1          VALUES(9),COMMNT(5), MATALT(10,21),MATREP(10,21)         XPLD 390
      DIMENSION WVALR(9), WVALA(9), SVALR(20), SVALA(20), XVALR(9,20),   XPLD 400
     1  XVALA(9,20), XVAL(9), DATE(3), IYDSEC(20), IOPTS(20)             XPLD 410
C*****DIMENSION ISEP(22)                                                 ****  420
C                                                                        XPLD 430
C*****DIMENSION INDEX(3001)                                              ****  440
      REAL MATREP,MATALT                                                 XPLD 450
      REAL*8 ISHULL, IYD, IYARD, IYDSEL, IYDSEC, IENDER, IYDP            ****  460
      REAL*8 JYARD                                                       ****  465
      REAL*8 IENDER/5H99999/                                             ****  470
      REAL*8 ISEP(22)/22*5H99999/                                        ****  480
      DATA IREP/1HR/, IALT/1HA/, ITOT/1HT/                               XPLD  490
```

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      DATA IWBS/1HW/, JSHOP/1HS/, IBOTH/1HB/, IBLANK/1H /                XPLD 500
      DATA PRI/1HP/                                                      XPLD 510
C*****DATA IENDER/5H99999/                                               **** 520
C*****DATA ISEP/22*5H99999/                                              **** 530
C**** DATA LAST/5HLAST /                                                 **** 535
      REAL*8 LAST/5HLAST /                                               **** 536
C*****DATA (INDEX(I),I=1,3000) /3000*0/                                  **** 540
C                                                                        XPLD 550
C      MASS STORAGE CALL AND MUST BE USED WITH CDC VERSION OF RDMTRX     XPLD 560
C*****CALL OPENMS(9,INDEX,3001,0)                                        **** 570
C                                                                        XPLD 580
C                                                                        XPLD 590
C        INITIAL CONDITIONS                                              XPLD 600
      JYARD = 0                                                          XPLD 610
      JJ = 0                                                             XPLD 620
      JWRITE = 0                                                         XPLD 630
      KWRITE = 0                                                         XPLD 640
      LWRITE = 0                                                         XPLD 650
      IUNIT = 12                                                         XPLD 660
      IEOF = 0                                                           XPLD 670
      ISHOP = 0                                                          XPLD 680
      IYD = 0                                                            XPLD 690
      DO 2 I = 1,13                                                      XPLD 700
C***2 IYARD(I) = 0                                                       **** 710
    2 IYARD(I) = 0.0                                                     **** 711
C                                                                        XPLC 720
C        READ CARD WITH REPORT IDENTIFICATION INFORMATION                XPLD 730
C        KIND IS THE INPUT PARAMETER FOR TYPE OF FILES REQUIRED          XPLD 740
C              (WBS, SHOP, BOTH, OR NONE)                                XPLD 750
C                                                                        XPLD 760
      READ(5,100)  DATE,KIND, (COMMNT(I),I=1,5), IBUGS, IBUGM, IBUGE     XPLD 770
  100 FORMAT(3A4,2X,A1,4X,5A4, 38X, 3I1)                                 XPLD 780
C                                                                        XPLD 790
C        SET VALUE OF IVER TO DETERMINE WHETHER TO CALCULATE WBS ONLY,   XPLD 800
C          SHOP ONLY, BOTH, OR NEITHER                                   XPLD 810
      IVER = 3                                                           XPLD 820
      IF(KIND.EQ.IWBS) IVER = 1                                          XPLD 830
      IF(KIND.EQ.JSHOP) IVER = 2                                         XPLD 840
      IF(KIND.EQ.IBOTH) IVER = 3                                         XPLD 850
      IF(KIND.EQ.IBLANK) IVER = 4                                        XPLD 860
C                                                                        XPLD 870
C        ZERO OUT YARD ARRAY AND OPTION ARRAY                            XPLD 880
      DO 7 K = 1,20                                                      XPLD 890
C**** IYDSEL(K) = 0                                                      **** 900
      IYDSEL(K) = 0.0                                                    **** 901
      IOPT(K) = 0                                                        XPLD 910
    7 CONTINUE                                                           XPLD 920
C                                                                        XPLD 930
C        READ CARDS FOR EACH YARD TO BE EXPLODED AND THE OPTION          XPLD 940
C                                                                        XPLD 950
      DO 10 K = 1,20                                                     XPLD 960
      KK = K                                                             XPLD 970
      READ(5,101)  IYDSEL(K), IOPT(K)                                    XPLD 980
  101 FORMAT(A5, 2X, A1)                                                 XPLD 990
      IF(IYDSEL(K) .EQ. LAST) GO TO 15                                   XPLD1000
   10 CONTINUE                                                           XPLD1010
C        SET NUMBER OF YARDS TO BE EXPLODED                              XPLD1020
      NYARDS = KK                                                        XPLD1030
      GO TO 20                                                           XPLD1040
   15 NYARDS = KK - 1                                                    XPLD1050
```

```
C                                                                       XPLD1060
C         READ DMAF HEADER RECORD AND RECORD OF ALL 9 S                 XPLD1070
C             WHICH FOLLOWS EACH HEADER RECORD                          XPLD1080
C                                                                       XPLD1090
   20 READ(IUNIT,102)  OWN,COAST,IYEAR,(IYARD(K),K=1,13)                XPLD1100
  102 FORMAT(2A1, I2, 13(1X,A5), / )                                    XPLD1110
      OWNP = OWN                                                        XPLD1120
      COASTP = COAST                                                    XPLD1130
C                                                                       XPLD1140
C         IF NO YARDS ARE TO BE EXPLODED, START READING DMAF            XPLD1150
      IF(NYARDS.EQ.0) GO TO 45                                          XPLD1160
      DO 22 I = 1,20                                                    XPLD1170
C**** IYDSEC(I) = 0                                                     ****1180
      IYDSEC(I) = 0.0                                                   ****1181
      IOPTS(I) = 0                                                      XPLD1190
   22 CONTINUE                                                          XPLD1200
C                                                                       XPLD1210
C         CHECK IF ANY OF THE REQUIRED YARDS ARE IN THIS SECTOR         XPLD1220
      JJ = 0                                                            XPLD1230
      DO 30 I = 1,13                                                    XPLD1240
      DO 25 J = 1,NYARDS                                                XPLD1250
      IF(IYDSEL(J) .NE. IYARD(I)) GO TO 25                              XPLD1260
      JJ = JJ + 1                                                       XPLD1270
      IYDSEC(JJ) = IYDSEL(J)                                            XPLD1280
      IOPTS(JJ) = IOPT(J)                                               XPLD1290
   25 CONTINUE                                                          XPLD1300
   30 CONTINUE                                                          XPLD1310
      NYARDS = NYARDS - JJ                                              XPLD1320
C     WRITE(6,997)  IYDSEC(JJ), IYARD(I)                                XPLD1325
C 997 FORMAT(1H , 9HIYDSEC = , A5, 2X, 8HIYARD = , A5)                  XPLD1328
C                                                                       XPLD1330
C         ARE ANY YARDS TO BE EXPLODED IN THIS SECTOR                   XPLD1340
      IF(JJ.EQ.0) GO TO 45                                              XPLD1350
C                                                                       XPLD1360
C         WRITE XPLOSION FILE HEADER RECORD ON TAPE8                    XPLD1370
C                                                                       XPLD1380
      WRITE(8)  OWN,COAST, IYEAR, (IYDSEC(I), IOPTS(I),I=1,13)          XPLD1390
C         DEBUG PRINT STATEMENT                                         XPLD1400
      IF(IBUGE.NE.1) GO TO 45                                           XPLD1410
C                                                                       XPLD1420
      WRITE(6,103) OWN,COAST, IYEAR,(IYDSEC(I), IOPTS(I),I=1,13)        XPLD1430
  103 FORMAT(1H ,2A1, 1X, I2, 13(1X,A5,1X,A1))                          XPLD1440
   45 IFIRST = 0                                                        XPLD1450
   48 IYDP = IYD                                                        XPLD1460
C                                                                       XPLD1470
C         READ DMAF RECORD                                              XPLD1480
   50 READ(IUNIT,104,END=240)  IYD, ISHULL, ISEQ,ICONT, ITYPWK, ISTRT,  ****1490
     1  IEND, ISPEC, OWN, COAST, IFYR, IPERD, IDAYS, ITDAYS, MATNOR,    ****1500
     2 MATNOA, IPERCT, ICRV, IREC                                       ****1510
C**50 READ(IUNIT,104)  IYD, ISHULL, ISEQ,ICONT,ITYPWK,ISTRT,IEND,ISPEC, ****1520
C****1    OWN,COAST,IFYR,IPERD,IDAYS,ITDAYS,MATNOR,MATNOA,              ****1530
C****2             IPERCT,ICRV,IREC                                     ****1540
  104 FORMAT(A5, A8, I4, A1, A3, 2I6, A3, 2A1, I2, I1, 2I7, 2I4, I3,    XPLD1550
     1  I2, 16X, I6)                                                   XPLD1560
C                                                                       XPLD1570
C*****IF(EOF(IUNIT) .NE.0) GO TO 240                                    ****1580
C                                                                       XPLD1590
      IF(IFIRST.EQ.1) GO TO 55                                          XPLD1600
      IFIRST = 1                                                        XPLD1610
C                                                                       XPLD1620
```

```
C        CHECK ON WHETHER TO EXPLODE THIS YARD                                  XPLD1630
C****  JYARD = 0                                                                ****1640
       JYARD = 0.0                                                              ****1641
       IF(NYARDS.NE.0) GO TO 55                                                 XPLD1645
       DO 52 I = 1, NYARDS                                                      XPLD1650
       II = I                                                                   XPLD1651
       IF(IYD.EQ.IYDSEC(I)) GO TO 53                                            XPLD1660
    52 CONTINUE                                                                 XPLD1670
       GO TO 55                                                                 XPLD1680
    53 JYARD = IYDSEC(II)                                                       XPLD1690
       JOPT = IOPTS(II)                                                         XPLD1700
C        SET VALUE OF IOPT                                                      XPLD1710
       IFLAG = 0                                                                XPLD1720
       IF(JOPT.EQ.IREP) IFLAG = 1                                               XPLD1730
       IF(JOPT.EQ.IALT) IFLAG = 2                                               XPLD1740
       IF(JOPT.EQ.ITCT) IFLAG = 3                                               XPLD1750
C                                                                               XPLD1760
C        ERROR PRINTOUT IF THERE IS NO VALUE FOR OPTION IN EXPLODE              XPLD1770
       IF(IFLAG.EQ.0) CALL IERROR(4,IFLAG,IDUM1,IDBL)                           XPLD1780
C                                                                               XPLD1790
C      CHECK ON WHETHER TO PROCESS THIS SECTOR                                  XPLD1800
    55 IF(KIND.EQ.IBLANK .AND. JJ .EQ.0) GO TO 50                               XPLD1810
C                                                                               XPLD1820
       IF(IYD.NE.IENDER) GO TO 58                                               XPLD1830
       IF(JYARD.NE.IYDP) GO TO 45                                               XPLD1840
       WRITE(8) (ISEP(I),I=1,22)                                                XPLD1850
       IF(IBUGE.NE.1) GO TO 45                                                  XPLD1851
       WRITE(6,994) (ISEP(I),I=1,22)                                            XPLD1852
   994 FORMAT(22A5)                                                             XPLD1853
       GO TO 45                                                                 XPLD1860
C                                                                               XPLD1870
    58 CALL ROMTRX(MATREP,MATALT,MATNOR,MATNOA,IREC)                            ****1880
C**58 CALL ROMTRX(MATREP,MATALT,MATNOR,MATNOA,IREC,INDEX)                       ****1890
       PCT = FLOAT(IPERCT) / 100.                                               XPLD1900
C                                                                               XPLD1910
C        CHANGE BLANKS TO ZEROS IN SHIP-HULL BY USING FUNCTION ICBZ             XPLD1920
C*****ISHULL = ICBZ(ISHULL)                                                     ****1930
C                                                                               XPLD1940
C        GROUP NUMBER IS A NECESSARY VARIABLE FOR THE WBS FILE                  XPLD1950
C                                                                               XPLD1960
       IGROUP = 0                                                               XPLD1970
C        CALCULATE REPAIR MANDAYS - DAYSR AND ALT MANDAYS -  DAYSA              XPLD1980
C        SET FRACTION PSP MANDAYS TO .8 IF MATRIX HAS ALL WORK IN OTHER         XPLD1981
       PSPREP = 1. - MATREP(10,20)                                              XPLD1982
       PSPALT = 1. - MATALT(10,20)                                              XPLD1983
       IF(ABS(PSPREP) .LE. .00005) GO TO 62                                     XPLD1984
    61 IF(ABS(PSPALT) .LE. .00005) GO TO 63                                     XPLD1985
       GO TO 64                                                                 XPLD1986
    62 WRITE(6,108) MATNOR                                                      XPLD1987
   108 FORMAT(1H , 27HERROR IN REPAIR MATRIX NO. , I4)                          XPLD1988
       PSPREP = .8                                                              XPLD1989
       GO TO 61                                                                 XPLD1990
    63 WRITE(6,109) MATNOA                                                      XPLD1991
   109 FORMAT(1H 24HERROR IN ALT MATRIX NO. , I4)                               XPLD1992
       PSPALT = .8                                                              XPLD1993
    64 DAYSR = (FLOAT(IDAYS)*(1.-PCT)) / PSPREP                                 XPLD1994
       DAYSA = (FLOAT(IDAYS) * PCT)  / PSPALT                                   XPLD2000
C                                                                               XPLD2010
       GO TO (60,70,60,80), IVER                                                XPLD2020
C                                                                               XPLD2030
```

```
C        FOR WBS, ONLY                                                  XPLD2040
C        COMPUTE TOTAL DIRECT REPAIR MANDAYS FOR WBS - WVALR AND        XPLD2050
C                TOTAL DIRECT ALT MANDAYS FOR WBS - WVALA               XPLD2060
C                  WRITE ON TAPE10                                      XPLD2070
   60 DO 65 I = 1, 9                                                    XPLD2080
      WVALR(I) =  DAYSR * MATREP(I,21)                                  XPLD2090
   65 WVALA(I) =  DAYSA * MATALT(I,21)                                  XPLD2100
C                                                                       XPLD2110
      WRITE(10) ISHULL, ITYPWK,IYD, IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2120
     1  ICONT, ISTRT,IEND,ISPEC,(WVALR(I),I=1,9),(WVALA(I),I=1,9),      XPLD2130
     2  MATREP(10,20), MATALT(10,20)                                    XPLD2140
C                                                                       XPLD2150
C        DEBUG PRINT STATEMENT                                          XPLD2160
      IF(IBUGW.NE.1) GO TO 68                                           XPLD2170
      JWRITE = JWRITE + 1                                               XPLD2180
      IF(JWRITE.GE.20) GO TO 68                                         XPLD2190
C                                                                       XPLD2200
      WRITE(6,105)ISHULL,ITYPWK,IYD,IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2210
     1  ICONT, ISTRT,IEND,ISPEC,(WVALR(I),I=1,9),(WVALA(I),I=1,9),      XPLD2220
     2  MATREP(10,20), MATALT(10,20)                                    XPLD2230
  105 FORMAT(1H , A8, 2X, A2, 2X, A5, 2X, I3, 2X, I2, 2X, 2A1, 2X, I1,  XPLD2240
     1  2X, A1, 2(2X,I6), 2X, A3, / 9(F10.2,1X) / 9(F10.2,1X), F10.6,    XPLD2250
     2  2X, F10.6)                                                      XPLD2260
   68 IF(IVER.NE.3) GO TO 80                                            XPLD2270
C                                                                       XPLD2280
C        FOR SHOPS, ONLY                                                XPLD2290
C        COMPUTE TOTAL DIRECT REPAIR MANDAYS FOR SHOPS - SVALR AND      XPLD2300
C          TOTAL DIRECT ALT MANDAYS FOR SHOPS - SVALA                   XPLD2310
C            WRITE ON TAPE11                                            XPLD2320
C        NO SHOP FILE IS CREATED FOR PRIVATE YARDS                      XPLD2330
C                                                                       XPLD2340
   70 IF(OWN .EQ. PRI ) GO TO 80                                        XPLD2350
      DO 75 I = 1,20                                                    XPLD2360
      SVALR(I) =  DAYSR * MATREP(10,I)                                  XPLD2370
   75 SVALA(I) =  DAYSA * MATALT(10,I)                                  XPLD2380
C                                                                       XPLD2390
      WRITE(11)  ISHULL,ITYPWK,IYD, IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2400
     1  ICONT, ISTRT,IEND,ISPEC,(SVALR(I),I=1,20), (SVALA(I),I=1,20),   XPLD2410
     2  IDAYS, IPERCT                                                   XPLD2420
C        DEBUG PRINT STATEMENT                                          XPLD2430
      IF(IBUGS.NE.1) GO TO 80                                           XPLD2440
      KWRITE = KWRITE + 1                                               XPLD2450
      IF(KWRITE.GE.20) GO TO 80                                         XPLD2460
C                                                                       XPLD2470
      WRITE(6,106)ISHULL,ITYPWK,IYD,IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2480
     1  ICONT, ISTRT,IEND,ISPEC,(SVALR(I),I=1,20), (SVALA(I),I=1,20),   XPLD2490
     2  IDAYS, IPERCT                                                   XPLD2500
  106 FORMAT(1H , A8, 2X, A2, 2X, A5, 2X, I3, 2X, I2, 2X, 2A1, 2X, I1,  XPLD2510
     1  2X, A1, 2(2X,I6), 2X, A3, / 10(F10.2,1X), / 10(F10.2,1X), /     XPLD2520
     2  10(F10.2,1X), / 10(F10.2,1X), I7, 2X, I3)                       XPLD2530
C                                                                       XPLD2540
C        SECTION FOR EXPLODING A YARD                                   XPLD2550
   80 IF(JYARD .NE. IYD) GO TO 48                                       XPLD2560
      DO 85 K = 1, 9                                                    XPLD2570
      VALUES(K) = 0.                                                    XPLD2580
   85 CONTINUE                                                          XPLD2590
C                                                                       XPLD2600
C        WRITE ZEROED MATERIAL RECORD                                   XPLD2610
      WRITE(8)  ISHULL, ITYPWK,IYD, IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2620
     1  ICONT, ISTRT,IEND,ISPEC,(VALUES(K),K=1,9),ISHOP                 XPLD2630
```

```
C                                                                       XPLD2640
C        DEBUG PRINT STATEMENT                                          XPLD2650
      IF(IBUGE.NE.1) GO TO 87                                           XPLD2660
      LWRITE = LWRITE + 1                                               XPLD2670
      IF(LWRITE.GE.5) GO TO 87                                          XPLD2680
C                                                                       XPLD2690
      WRITE(6,107)ISHULL,ITYPWK,IYD,IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2700
     1  ICONT, ISTRT,IEND,ISPEC,(VALUES(K),K=1,9),ISHOP                 XPLD2710
C                                                                       XPLD2720
   87 DO 220 III = 1, 20                                                XPLD2730
      DO 95 II = 1,9                                                    XPLD2740
      IF(IFLAG.EQ.2) GO TO 90                                           XPLD2750
      XVALR(II,III) =  DAYSR * MATREP(II,III)                           XPLD2760
      IF(IFLAG.EQ.1) GO TO 95                                           XPLD2770
   90 XVALA(II,III) =  DAYSA * MATALT(II,III)                           XPLD2780
   95 CONTINUE                                                          XPLD2790
      DO 215 II = 1,9                                                   XPLD2800
      GO TO (200,205,210), IFLAG                                        XPLD2810
C                                                                       XPLD2820
C        COMPUTE REPAIRS ONLY                                           XPLD2830
  200 XVAL(II) = XVALR(II,III)                                          XPLD2840
      GO TO 215                                                         XPLD2850
C                                                                       XPLD2860
C        COMPUTE ALTS ONLY                                              XPLD2870
  205 XVAL(II) = XVALA(II,III)                                          XPLD2880
      GO TO 215                                                         XPLD2890
C                                                                       XPLD2900
C        COMPUTE TOTAL OF REPAIRS AND ALTS                              XPLD2910
  210 XVAL(II) = XVALR(II,III) + XVALA(II,III)                          XPLD2920
  215 CONTINUE                                                          XPLD2930
C                                                                       XPLD2940
      WRITE(8)  ISHULL, ITYPWK,IYD, IGROUP,IFYR, OWN, COAST, IPERD,     XPLD2950
     1  ICONT, ISTRT,IEND,ISPEC,(XVAL(K),K=1,9),III                     XPLD2960
C                                                                       XPLD2970
C          DEBUG PRINT STATEMENT                                        XPLD2980
      IF(IBUGE.NE.1) GO TO 220                                          XPLD2990
      IF(LWRITE.GE.5) GO TO 220                                         XPLD3000
C                                                                       XPLD3010
      WRITE(6,107)ISHULL,ITYPWK,IYD,IGROUP,IFYR, OWN, COAST, IPERD,     XPLD3020
     1  ICONT, ISTRT,IEND,ISPEC,(XVAL(K),K=1,9),III                     XPLD3030
  107 FORMAT(1H , A8, 1X, A2, 1X, A5, 1X, I3, 1X, I2, 1X, 2A1, 1X, I1,  XPLD3040
     1  1X,A1,1X,I6,1X,I6, 1X,A3,1X,9F8.2,1X, I2)                       XPLD3050
  220 CONTINUE                                                          XPLD3060
      GO TO 50                                                          XPLD3070
C                                                                       XPLD3080
C        INCREMENT UNIT NUMBER FOR THE NEXT SECTOR OF DMAF              XPLD3085
  240 IUNIT = IUNIT + 1                                                 XPLD3090
      CALL IERROR(2,OWNP,COASTP,IYD)                                    XPLD3100
      IEOF = IEOF + 1                                                   XPLD3110
C                                                                       XPLD3115
C        IF ALL 4 DMAF FILES HAVE BEEN READ, STOP                       XPLD3116
      IF(IEOF.GE.4) STOP                                                XPLD3120
      GO TO 20                                                          XPLD3130
      END                                                               XPLD3140
```

```
      SUBROUTINE IERROR(N,IDUMMY,IDUM1,IDBL)                            IERR  10
C                                                                       IERR  11
C        SUBROUTINE IERROR IS ENTERED WITH AN ERROR CODE AND            IERR  12
C          THE CORRESPONDING ERROR MESSAGE IS WRITTEN                   IERR  13
C                                                                       IERR  14
      REAL*8 IDBL                                                       ****  20
      GO TO (10,20,30,40), N                                            IERR  30
   10 WRITE(6,100) IDUMMY                                               IERR  40
      IDUMMY = -1                                                       IERR  50
      RETURN                                                            IERR  60
   20 WRITE(6,101) IDUMMY,IDUM1                                         IERR  70
      RETURN                                                            IERR  80
   30 WRITE(6,102) IDUMMY                                               IERR  90
      IDUMMY = -1                                                       IERR 100
      RETURN                                                            IERR 110
   40 WRITE(6,103)                                                      IERR 120
      IDUMMY = 3                                                        IERR 130
      RETURN                                                            IERR 140
  100 FORMAT(1H , 33H *** ALT MATRIX FOR RECORD NUMBER, 1X, I5, 2X,     IERR 150
     1       19H DOES NOT EXIS\ ***)                                    IERR 155
  101 FORMAT(1H , 31H*** EOF ENCOUNTERED ON DMAF IN ,2A1, 4H *** )      IERR 160
  102 FORMAT(36H *** REPAIR MATRIX FOR RECORD NUMBER, I5,2X,            IERR 170
     1       19H DOES NOT EXIST ***)                                    IERR 180
  103 FORMAT(1H , 45HNO VALUE FOR EXPLOSION OPTION - TOTAL ASSUMED )    IERR 190
      END                                                               IERR 200
```

```
C*****SUBROUTINE RDMTRX(MATREP,MATALT,MATNOR,MATNOA,IREC,INDEX)          **** 10
      SUBROUTINE RDMTRX(MATREP,MATALT,MATNOR,MATNOA,IREC)               **** 20
C                                                                       RDMX 21
C        SUBROUTINE RDMTRX READS THE RANDOM ACCESS FILE OF MATRICES     RDMX 22
C        IT IS ENTERED WITH A REPAIR AND AN ALT MATRIX NUMBER AND       RDMX 23
C          RETURNS THE 2 MATRICES                                       RDMX 24
C        AN ILLEGAL MATRIX NUMBER OR A MATRIX NUMBER = 0                RDMX 25
C          WILL PRODUCE A MATRIX OF ALL ZEROS                           RDMX 26
C                                                                       RDMX 27
      DIMENSION MATALT(10,21),MATREP(10,21)                             **** 30
      DEFINE FILE 9(3000,840,L,IASSC)                                   **** 40
C*****DIMENSION MATALT(10,21),MATREP(10,21),INDEX(3001)                 **** 50
      REAL MATREP, MATALT                                               RDMX 60
      IF(MATNOR.LE.1500. .OR. MATNOR.GT. 3000) GO TO 20                 **** 80
C------                                                                 RDMX 90
C*****IF(INDEX(MATNOR) .EQ. 0) GO TO 20                                 **** 100
C--------                                                               RDMX 110
C*****CALL READMS(9,MATREP,210,MATNOR)                                  **** 120
      READ(9@MATNOR,ERR=20) MATREP                                      **** 130
    5 IF(MATNOA.LE.0. .OR. MATNOA.GE. 1500.) GO TO 30                   **** 150
C----                                                                   RDMX 160
C*****IF(INDEX(MATNOA) .EQ. 0) GO TO 30                                 **** 170
C----                                                                   RDMX 180
      READ(9@MATNOA,ERR=30) MATALT                                      **** 190
C*****CALL READMS(9,MATALT,210,MATNOA)                                  **** 200
      GO TO 40                                                          RDMX 210
   20 CALL IERROR(3,IREC,IDUM1,IDBL)                                    RDMX 220
C        IREC IS RETURNED AS A NEGATIVE FROM SUBROUTINE IERROR          RDMX 230
      IF(IREC.GE.0) GO TO 5                                             RDMX 240
      DO 24 II = 1,21                                                   RDMX 250
      DO 22 I = 1,10                                                    RDMX 260
   22 MATREP(I,II) = 0.                                                 RDMX 270
   24 CONTINUE                                                          RDMX 280
      GO TO 5                                                           RDMX 290
   30 CALL IERROR(1,IREC,IDUM1,IDBL)                                    RDMX 300
C        IREC IS RETURNED AS A NEGATIVE FROM SUBROUTINE IERROR          RDMX 310
      IF(IREC.GE.0) GO TO 40                                            RDMX 320
      DO 34 II = 1,21                                                   RDMX 330
      DO 32 I = 1,10                                                    RDMX 340
   32 MATALT(I,II) = 0.                                                 RDMX 350
   34 CONTINUE                                                          RDMX 360
   40 RETURN                                                            RDMX 370
      END                                                               RDMX 380
```

5.1.6 PROGRAM GLOSSARY

LOCAL VARIABLES

Main Program

COAST	Coast (east or west).
COASTP	Coast (of previous record).
COMMNT(5)	Array of report identification information.
DATE(3)	Array containing the date of the run.
DAYSA	Alteration mandays.
DAYSR	Repair mandays.
I	DO-loop index.
IALT	Variable containing the character "A".
IBLANK	One-character blank space.
IBOTH	Variable containing the character "B".
IBUGE	Input variable; set to "1" if intermediate printout of SWBS-Shop Matrix File is desired; otherwise set to "0".
IBUGS	Input variable; set to "1" if intermediate printout of Shop File is desired; otherwise set to "0".
IBUGW	Input variable; set to "1" if intermediate printout of SWBS File is desired; otherwise set to "0".
ICONT	Continuation indicator.
ICRV	Labor distribution histogram number.
IDAYS	Production shop productive (PSP) mandays for this period.
IDBL	Double precision argument used to transfer yard names to subroutine IERROR.
IDUM1	Dummy variable used as an argument in subroutine IERROR.
IEND	Availability end date (mo/dy/yr).
IENDER	Variable containing the characters "99999".
IEOF	Counter used to determine number of DMAF-4 files read.
IFIRST	Flag set to "1" after reading first record of a sector; otherwise set to "0".

Main Program (Continued)

IFLAG	Flag which, when set to "1", indicates that repairs are to be processed; when set to "2", indicates that alterations are to be processed; when set to "3", indicates that the total of repairs and alterations are to be processed for the SWBS-Shop Matrix File.
IFYR	Fiscal year for this record.
IGROUP	Group number.
II	Subscript designating specific SWBS values.
III	Subscript designating specific Shop values.
IOPT(20)	Array of options for creating SWBS-Shop Matrix File for all yards.
IOPTS(20)	Array of options for creating SWBS-Shop Matrix File for all yards in a given sector.
IPERCT	Percent of PSP mandays for alterations.
IPERD	Period (this record).
IREC	DMAF record number.
IREP	Variable containing the character "R".
ISEP(22)	Array of all "9's" used as a separator record on the SWBS-Shop Matrix File.
ISEQ	Sequence number.
ISHOP	Index used to identify the shop numbers.
ISHULL	Ship type and hull number, read as a single variable from DMAF.
ISPEC	Specialization category.
ISTRT	Availability start date (mo/dy/yr).
ITDAYS	Total PSP mandays.
ITOT	Variable containing the character "T".
ITYPWK	Type work.
IUNIT	Variable used for the unit number of the four DMAF-4 Files.
IVER	Flag controlling the options for creating files. When set to "1", create SWBS File; when set to "2", create Shop File; when set to "3", create both SWBS and Shop Files; when set to "4", don't create either file.
IWBS	Variable containing the character "W".

Main Program (Continued)

IYARD(13)	Array containing a list of shipyards appearing on the DMAF-4 File currently being processed.
IYD	Yard name.
IYDP	Yard name (of previous record).
IYDSEC(20)	Array containing a list of yards to be "exploded" for the current sector.
IYDSEL(20)	Array containing a list of all yards to be "exploded".
IYEAR	First calendar year on DMAF.
J	DO-loop index.
JJ	Counter used to determine the number of yards required for each sector.
JSHOP	Variable containing the character "S".
JWRITE	Variable which controls the number of lines of intermediate output of the SWBS File.
K	DO-loop index.
KIND	Variable which controls the output files required - SWBS, Shop, both, or none.
KK	Counter used to determine the total number of yards to be processed.
KWRITE	Variable which controls the number of lines of intermediate output of the Shop File.
LWRITE	Variable which controls the number of lines of intermediate output of the SWBS-Shop Matrix File.
MATALT(10,21)	Alteration matrix values; the first subscript refers to the SWBS and the second to the shops.
MATNOA	Alterations matrix number.
MATNOR	Repair matrix number.
MATREP(10,21)	Repair matrix values; the first subscript refers to the SWBS and the second to the shops.
NYARDS	Number of yards to be processed.
OWN	Yard ownership indicator.
OWNP	Yard ownership indicator (of previous record).
PCP	Equals $\frac{\text{IPERCT}}{100}$.
PRI	Variable containing the character "P".
SVALA(20)	Array of total direct alterations mandays for shops.
SVALR(20)	Array of total direct repair mandays for shops.

Main Program (Continued)

VALUES(9)	Array of dummy material factors for each of the nine single-digit SWBS elements.
WVALA(9)	Array of total direct alterations mandays for each of the nine SWBS elements.
WVALR(9)	Array of total direct repair mandays for each of the nine SWBS elements.
XVAL(9)	Array of mandays for repairs, alterations, or total of repairs and alterations for each of the nine SWBS elements.
XVALA(9,20)	Array of alterations mandays; the first subscript refers to the SWBS and the second to the shop.
XVALR(9,20)	Array of repair mandays where the first subscript refers to the SWBS and the second to the shop.

Subroutine IERROR

IDUMMY	Dummy argument used to transfer information for error messages.
IDUM1	Dummy argument used to transfer additional information for error messages.
N	Error number.

Subroutine RDMTRX

I	DO-loop index.
IDUM1	Dummy argument in subroutine IERROR.
II	DO-loop index.
IREC	Flag set to "-1" when a repair or alterations matrix is to contain all zeros; otherwise, it is the DMAF-4 record number.
MATALT(10,21)	Alterations matrix values; the first subscript refers to the SWBS and the second to the shops.
MATNOA	Alterations matrix number.
MATNOR	Repair matrix number.
MATREP(10,21)	Repair matrix values; the first subscript refers to the SWBS and the second to the shops.

5.1.7 SAMPLE RUN

The card input (unit 5) for the sample run requested that both a SWBS File and a Shop File be created by program XPLODE. The debug print flags were set to produce partial output of the files, and Norfolk was selected as the yard to be "exploded". A SWBS-Shop Matrix File was created for the total of repair and alterations mandays. Input files required by program XPLODE were the Repair and Alterations Matrix File and the Depot Maintenance Assignment Files, Version 4 (DMAF-4). The Matrix File (unit 9), created by programs REPGEN and ALTGEN, is a random access file and cannot be readily listed. Therefore a utility program was written to read any desired matrix and write it in a readable format. Three repair matrices and three alterations matrices were generated. The DMAF-4 (units 12-15) used as input to program XPLODE for the sample run was separated into four individual files according to sector. Each file contained a header record and a separator record of all 9's between yards.

The basic output of program XPLODE included a SWBS-Shop Matrix File, a SWBS File and a Shop File. These files were used by the Report Generator programs to produce summary reports. Small portions of each file were printed for debugging purposes and samples of each file are shown on pages 45 thru 47.

For each record on DMAF, the SWBS-Shop Matrix File (unit 8) contains a record reserved for material costs and one record of SWBS data for each of the 20 shops. The sample output shows a header record for Norfolk and data for two DMAF records.

The sample SWBS File (unit 10) shows 15 data records. Each record was printed on three lines for ease of reading. The first line contains identifying information from DMAF. The second line gives the 9 total direct repair mandays for SWBS, and the third line gives the 9 total direct alterations mandays for SWBS and the fraction of total direct mandays required for other direct for (repairs and for alterations). There were no header or separator records.

The sample Shop File (unit 11) shows 10 data records. Each of these records was printed on five lines. The first line contains identifying

information from DMAF. The second and third lines give the total direct repair mandays for each of the 20 shops and the fourth and fifth lines give the total direct alterations mandays for each of the 20 shops, plus two other values from DMAF. These are the production shop productive (PSP) mandays for that record and the percent of PSP mandays for alterations.

Unit 5 - Card Inputs

```
08/29/77        8     NORFOLK DATA                          111
NORVA  T
LAST
```

Unit 9 - Repair and Alterations Matrix File

Sample Repair Matrices

REPAIR MATRIX NUMBER 1502 — SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.0047	.0002	.0001	.0032	.0002	.0000	.0002	.0001	.0007	.0007	.0006	.0000	.0001	.0008	.0315	.0000	.0000	.0002	.0005	.0148
200	.0006	.0025	.0050	.0002	.0051	.0391	.0000	.0380	.0135	.0585	.0783	.0031	.0000	.0037	.0042	.0259	.0001	.0005	.0014	.0543	.3340
300	.0000	.0020	.0011	.0001	.0017	.0044	.0008	.0035	.0004	.0148	.0024	.0006	.0000	.0009	.0009	.0026	.0000	.0000	.0003	.0011	.0378
400	.0000	.0013	.0014	.0001	.0011	.0066	.0156	.0009	.0001	.0223	.0098	.0017	.0000	.0290	.0039	.0022	.0001	.0001	.0004	.0055	.1021
500	.0003	.0027	.0053	.0002	.0065	.0277	.0000	.0146	.0019	.0068	.0418	.0025	.0000	.0000	.0023	.0072	.0001	.0003	.0004	.0041	.1249
600	.0000	.0046	.0049	.0004	.0038	.0005	.0000	.0009	.0030	.0016	.0016	.0057	.0000	.0000	.0238	.0163	.0001	.0002	.0012	.0028	.0711
700	.0000	.0005	.0002	.0000	.0002	.0006	.0039	.0017	.0000	.0003	.0004	.0003	.0000	.0005	.0003	.0005	.0000	.0000	.0008	.0008	.0102
800	.0000	.0080	.0006	.0000	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0016	.0000	.0000	.0000	.0001	.0000	.0001	.0000	.1475	.1495
900	.0000	.0119	.0027	.0008	.0059	.0091	.0022	.0183	.0125	.0088	.0148	.0037	.0000	.0077	.0036	.0189	.0001	.0002	.0168	.0285	.1564
TOT	.0010	.0302	.0208	.0019	.0276	.0882	.0225	.0781	.0214	.1139	.1499	.0197	.0000	.0420	.0399	.0753	.0004	.0014	.0287	.2452	1.0000

REPAIR MATRIX NUMBER 1503 — SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.0060	.0002	.0001	.0037	.0001	.0000	.0001	.0001	.0004	.0005	.0003	.0000	.0001	.0005	.0010	.0000	.0000	.0001	.0003	.0133
200	.0006	.0025	.0049	.0002	.0050	.0383	.0000	.0372	.0132	.0573	.0767	.0030	.0000	.0036	.0042	.0254	.0000	.0005	.0014	.0531	.3270
300	.0000	.0021	.0015	.0001	.0024	.0116	.0002	.0115	.0010	.0118	.0069	.0007	.0000	.0008	.0010	.0039	.0000	.0001	.0004	.0015	.0576
400	.0000	.0006	.0006	.0000	.0004	.0032	.0072	.0004	.0000	.0083	.0044	.0006	.0000	.0159	.0016	.0010	.0001	.0001	.0002	.0027	.0473
500	.0004	.0021	.0100	.0002	.0057	.0208	.0000	.0112	.0013	.0074	.0370	.0022	.0000	.0000	.0024	.0059	.0000	.0003	.0004	.0038	.1111
600	.0000	.0021	.0130	.0002	.0030	.0003	.0000	.0007	.0013	.0010	.0045	.0043	.0000	.0006	.0163	.0116	.0000	.0001	.0013	.0029	.0633
700	.0000	.0002	.0001	.0000	.0001	.0004	.0029	.0017	.0000	.0002	.0003	.0002	.0000	.0005	.0003	.0003	.0000	.0000	.0000	.0005	.0079
800	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0005	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1721	.1727
900	.0000	.0140	.0039	.0009	.0077	.0105	.0039	.0173	.0038	.0062	.0183	.0119	.0000	.0034	.0046	.0283	.0001	.0004	.0191	.0455	.1998
TOT	.0010	.0295	.0342	.0017	.0280	.0851	.0142	.0801	.0207	.0928	.1486	.0238	.0000	.0249	.0309	.0774	.0003	.0014	.0228	.2825	1.0000

REPAIR MATRIX NUMBER 1504 — SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.0478	.0022	.0014	.0354	.0013	.0002	.0021	.0012	.0072	.0078	.0045	.0000	.0009	.0375	.0162	.0000	.0001	.0020	.0051	.1430
200	.0000	.0042	.0132	.0013	.0171	.0871	.0000	.0727	.0299	.0092	.0724	.0037	.0000	.0007	.0037	.0234	.0005	.0007	.0003	.0073	.3476
300	.0001	.0024	.0013	.0001	.0019	.0026	.0012	.0012	.0002	.0192	.0015	.0008	.0000	.0011	.0010	.0027	.0000	.0000	.0003	.0013	.0389
400	.0000	.0032	.0003	.0000	.0002	.0013	.0000	.0001	.0000	.0044	.0018	.0001	.0000	.0074	.0004	.0003	.0000	.0000	.0000	.0007	.0173
500	.0007	.0039	.0190	.0006	.0080	.0637	.0000	.1014	.0046	.0373	.0680	.0032	.0000	.0000	.0043	.0152	.0001	.0009	.0012	.0119	.3432
600	.0000	.0337	.0306	.0102	.0145	.0005	.0000	.0007	.0005	.0032	.0024	.0230	.0000	.0000	.0111	.0137	.0000	.0004	.0013	.0012	.1069
700	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
800	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
900	.0000	.0000	.0001	.0000	.0001	.0003	.0001	.0006	.0001	.0002	.0006	.0000	.0000	.0001	.0000	.0001	.0000	.0000	.0000	.0007	.0031
TOT	.0008	.0622	.0668	.0036	.0772	.1569	.0015	.1789	.0366	.0806	.1544	.0353	.0000	.0103	.0279	.0717	.0007	.0022	.0052	.0273	1.0000

Unit 9 - Repair and Alterations Matrix File

Sample Alterations Matrices

ALTERATION MATRIX NUMBER 6 SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
200	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
300	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
400	.0000	.0000	.0042	.0000	.0004	.0418	.0000	.0031	.0008	.0767	.1396	.0000	.0000	.6561	.0061	.0106	.0000	.0008	.0277	.0321	1.0000
500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
600	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
700	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
800	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
900	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
TOT	.0000	.0000	.0042	.0000	.0004	.0418	.0000	.0031	.0008	.0767	.1396	.0000	.0000	.6561	.0061	.0106	.0000	.0008	.0277	.0321	1.0000

ALTERATION MATRIX NUMBER 7 SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.1021	.0009	.0020	.0157	.0110	.0000	.0058	.0012	.0049	.0015	.0059	.0000	.0001	.0060	.0091	.0000	.0002	.0006	.0063	.1813
200	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
300	.0000	.0000	.0008	.0000	.0007	.0021	.0000	.0023	.0002	.0009	.0040	.0002	.0000	.0000	.0002	.0007	.0000	.0000	.0008	.0009	.0129
400	.0000	.0021	.0044	.0000	.0020	.0247	.0128	.0023	.0002	.0333	.0519	.0022	.0000	.2060	.0071	.0076	.0000	.0004	.0018	.2022	.5613
500	.0000	.0052	.0000	.0001	.0052	.0064	.0000	.0151	.0009	.0003	.0030	.0049	.0000	.0000	.0013	.0057	.0000	.0002	.0003	.0297	.0784
600	.0000	.0003	.0002	.0000	.0001	.0006	.0047	.0028	.0000	.0003	.0006	.0004	.0000	.0000	.0005	.0006	.0000	.0000	.0000	.0009	.0129
700	.0000	.0219	.0013	.0000	.0053	.0131	.0656	.0000	.0007	.0052	.0020	.0032	.0000	.0000	.0027	.0113	.0000	.0002	.0001	.0286	.1532
800	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
900	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
TOT	.0000	.1316	.0078	.0023	.0291	.0580	.0831	.0283	.0031	.0449	.0629	.0167	.0000	.2069	.0179	.0350	.0001	.0011	.0108	.2606	1.0000

ALTERATION MATRIX NUMBER 8 SHOP CATEGORIES

SWBS	6	11	17	23	26	31	36	38	41	51	56	64	65	67	71	72	81	94	99	OTH	TOTAL
100	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
200	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
300	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
400	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
600	.0000	.0000	.0000	.0000	.0000	.0000	.0060	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
700	.0000	.1432	.0087	.0003	.0348	.0853	.4286	.0000	.0043	.0337	.0128	.0209	.0000	.0000	.0174	.0739	.0000	.0015	.0005	.1347	1.0000
800	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
900	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	0.0000
TOT	.0000	.1432	.0087	.0003	.0348	.0853	.4286	.0000	.0043	.0337	.0128	.0209	.0000	.0000	.0174	.0739	.0000	.0015	.0005	.1347	1.0000

Unit 12 - Depot Maintenance Assignment File, Version 4, (DMAF-4), NE

```
NE78 CHASN NORVA                                                
```

Unit 13 - Depot Maintenance Assignment File, Version 4 (DMAF-4), NW

```
NW78 LBECH PUGET                                                
```

Unit 14 - Depot Maintenance Assignment File, Version 4 (DMAF-4), PE

```
PE78 D 06                                                                                                                    1
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999     2
D 06 CV    59  41 RA 11 378 12979CVAPE791  73258  732581506  14 3917       0                                                3
D 06 CV    60  53 RA  1 678 4 378CVAPE781  86977  893601506  16 4017       0                                                4
D 06 CV    60  53*RA  1 678 4 378CVAPE782   2382  893601506  16 4017       0                                                5
D 06 CV    60  61 RA  7 18210 182CVAPE822  59484  600001506  18 4217       0                                                6
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999     7
```


Unit 15 - Depot Maintenance Assignment File, Version 4 (DMAF-4), PW

```
PW78 D 11  D 12  NWPAC                                                                                                       1
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999     2
D 11 CV    61  51 RA  2 180 5 180CVAPW801  44312  600001506  20 42 1       0                                                3
D 11 CV    61  51*RA  2 180 5 180CVAPW802  15687  600001506  20 42 1       0                                                4
D 11 CV    61  52 RA  9 18112 181CVAPW812  14731  600001506  21 46 1       0                                                5
D 11 CV    61  52*RA  9 18112 181CVAPW821  45268  600001506  21 46 1       0                                                6
D 11 CV    62  42 RA  1 281 4 181CVAPW811  59925  600001506  24 41 1       0                                                7
D 11 CV    62  42*RA  1 281 4 181CVAPW812     74  600001506  24 41 1       0                                                8
D 11 CV    62  43 RA  5 182 8 182CVAPW822  60000  600001506  25 41 1       0                                                9
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999    10
D 12 CV    43  41 RA  31080 71180CVAPW801   2096  1000015061500  017       0                                               11
D 12 CV    43  41*RA  31080 71180CVAPW802   7903  1000015061500  017       0                                               12
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999    13
NWPACCV    41  35 RA  71078 91178CVAPW782  40000  400001506  10 4917       0                                               14
99999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999999    15
```

Unit 8 - SWBS-Shop Matrix File

```
NE 78 NORVA T
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00  0
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN      0.00      .26      .70     0.00     9.43     0.00     0.00     0.00     0.00  1
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN    611.93    54.02    30.31     2.95    49.27    47.45     0.00     0.00      .38  2
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     28.72   169.05    16.47    37.85   243.21   392.08     0.00     0.00     1.11  3
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     17.93    17.21     1.19      .89     7.26     2.05     0.00     0.00      .10  4
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN    453.14   218.76    24.19     5.85   182.83   185.83     0.00     0.00     1.69  5
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     16.83  1114.15    33.39   360.59   814.91     6.84     0.00     0.00     3.59  6
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN      2.01     0.00    15.53      .32      .06     0.00     0.00     0.00     1.73  7
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     27.44   930.15    14.98    27.03  1297.44     9.30     0.00     0.00     7.40  8
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     15.37   383.14     2.54     6.61    58.84     6.29     0.00     0.00     1.51  9
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     92.20   117.75   245.84   686.15   476.64    40.48     0.00     0.00     2.29 10
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     99.70   926.00    19.76  1170.07   869.92    30.09     0.00     0.00     7.10 11
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     57.63    47.18     9.85     1.75    41.22   293.62     0.00     0.00      .29 12
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00 13
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     10.98     9.06    14.53  5488.24      .39     0.00     0.00     0.00     1.21 14
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     95.86    47.43    12.44    54.93    54.70   141.68     0.00     0.00      .60 15
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN    206.72   299.78    35.13    91.50   194.87   175.73     0.00     0.00     1.14 16
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN      .37     5.93      .10     0.00     1.89     0.00     0.00     0.00      .03 17
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     1.10     9.29      .30     6.81    11.72     5.20     0.00     0.00      .05 18
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     26.16     4.13     4.28   228.18    15.59    16.00     0.00     0.00      .04 19
CGN   37 RA NORVA   0 78 NE 2    62178  82278 AAN     65.31    93.59    16.12   272.25   140.34    15.73     0.00     0.00     9.41 20
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00  0
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      .06    45.47      .87      .11    31.93     1.17      .26     0.00     1.37  1
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN   1810.41   203.07   170.91    75.61   241.66   172.95   299.36      .06  1147.32  2
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     25.59   398.40   136.65   104.82   818.01  1069.54    28.96     0.03   321.67  3
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     32.96    19.53     8.77     2.65    16.84    14.64     1.30     0.00    75.28  4
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    505.65   406.85   206.81    63.04   534.51   248.53    75.79      .73   631.17  5
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    148.69  3140.55   975.04   580.40  1786.42    32.15   200.20     3.52   857.98  6
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      .90     0.00    19.43   755.25      .42    61.05  1088.72     0.00   315.69  7
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     85.00  3048.44   970.96    60.83  1113.70    96.81   139.79     0.00  1416.29  8
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     21.27  1082.60    83.06     3.80   121.21   105.25     9.17     0.00   309.90  9
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     98.80  4696.81   981.86  1115.46   607.87    87.40    84.02     0.00   510.58 10
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     56.55  6282.74   618.79  1033.86  3071.33   372.77    53.32     0.00  1501.35 11
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    101.40   246.10    59.11    80.73   240.82   360.71    58.97    42.03   977.24 12
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00 13
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      5.23   297.77    61.63  3968.38     2.52    62.65    41.04     0.00   276.16 14
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    115.67   340.64    88.79   226.85   211.00  1344.40    58.16      .28   376.81 15
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    198.15  2081.09   328.18   180.50   559.63   959.74   174.12     1.30  2316.32 16
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN      .56     4.02     2.44     4.55     3.31     3.22      .19     0.00     6.67 17
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN     3.68    38.75    10.11     9.92    24.00     8.75     3.55      .56    32.21 18
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    120.64   111.14    29.96    37.68    34.30   103.72     3.10     0.00  1568.55 19
CGN   37 RO NORVA   0 81 NE 1    10281  30582 AAN    106.04  4352.76   133.52  2837.66   699.97   248.59   310.70141 3.80  3730.48 20
```

Unit 10 - SWBS File

```
CGN   40  RA  CHASN    0  82  NE  2       50182   70182  AAN
  1764.11     4288.15     479.89      213.42     4233.87     1318.77        0.00        0.00       38.24
     0.00        0.00       0.00        0.00        0.00        0.00        0.00        0.00        0.00   .027273   0.000000
CGN   37  RA  NORVA    0  78  NE  2       62178   82278  AAN
  1829.38     4446.81     497.64      221.32     4390.52     1367.56        0.00        0.00       39.66
     0.00        0.00       0.00     8219.86        0.00        0.00        0.00        0.00        0.00   .027273   .032188
CGN   37  RO  NORVA    0  81  NE  1       10281   30582  AAN
  1089.90    26796.73    4720.16     3876.10     9104.33     5187.26      647.38    14152.28    16373.05
  2347.35        0.00     166.75     7266.02     1015.13      166.75     1983.32        0.00        0.00   .282497   .260609
CGN   37  RO  NORVA    0  81  NE  2  *    10281   30582  AAN
  2579.65    63424.55   11172.03     9174.25    21548.83    12277.60     1532.28    33496.70    38752.98
  5555.90        0.00     394.68    17197.77     2402.70      394.68     4694.28        0.00        0.00   .282497   .260609
CGN   37  RO  NORVA    0  82  NE  1  *    10281   30582  AAN
   762.13    18737.99    3300.64     2710.42     6366.33     3627.26      452.69     9896.18    11449.09
  1641.42        0.00     116.60     5080.87      709.85      116.60     1386.87        0.00        0.00   .282497   .260609
CGN   38  RA  NORVA    0  79  NE  2       80379  100279  AAN
  1195.10     2905.01     325.10      144.58     2868.23      893.40        0.00        0.00       25.91
     0.00        0.00       0.00        0.00        0.00        0.00     4421.13        0.00        0.00   .027273   .134700
CGN   38  RA  NORVA    0  80  NE  1  *    80379  100279  AAN
     4.40       10.69       1.20         .53       10.56        3.29        0.00        0.00         .10
     0.00        0.00       0.00        0.00        0.00        0.00       16.27        0.00        0.00   .027273   .134700
CGN   38  RO  NORVA    0  82  NE  2       70182   90283  AAN
  1294.00    31814.81    5604.08     4601.96    10809.25     6158.65      768.61    16802.50    19439.14
     0.00        0.00       0.00        0.00        0.00        0.00        0.00        0.00        0.00   .282497   0.000000
CV    59  RA  NORVA    0  80  NE  2       50380   72980  CVA
  1087.53     7879.78    1924.83     3646.65    14470.07     2928.60     1838.36        0.00     3898.54
   840.03     1040.09       0.00     3316.43    13443.44      509.85    10562.08        0.00        0.00   .090289   .131661
CV    59  RA  NORVA    0  82  NE  1      100181   10182  CVA
  1767.60    13824.18    3376.90     6397.64    25386.10     5137.90     3225.20        0.00     6839.54
     0.00        0.00       0.00        0.00        0.00        0.00        0.00        0.00        0.00   .090289   0.000000
CV    60  RO  NORVA    0  79  NE  2       42079  120179  CVA
  8826.54    30881.64    3917.90     5505.33    37479.03    12178.27     3411.28       11.26    10380.28
  1969.72     4069.19       0.00    30804.94    17698.76      903.04    52928.20        0.00        0.00   .082278   .154559
CV    60  RO  NORVA    0  80  NE  1  *    42079  120179  CVA
  2039.97     7137.29     905.50     1272.38     8662.87     2812.76      788.41        2.60     2399.05
   455.24      940.46       0.00     7119.56     4090.58      208.71    12232.64        0.00        0.00   .082278   .154559
CV    62  RO  NORVA    0  78  NE  1      112177  101978  CVA
  7080.87    24771.21    3142.68     4416.81    30063.20     9762.19     2736.30        9.03     8326.30
     0.00      657.45     119.61    14637.83    18161.35      892.04    29953.32        0.00        0.00   .082278   .106010
CV    62  RO  NORVA    0  78  NE  2  *    112177  101978  CVA
 10060.25    35198.04    4465.52     6274.82    42717.57    13871.34     3888.88       12.83    11831.86
     0.00      934.19     169.96    20799.27    25805.93     1267.53    42561.44        0.00        0.00   .082278   .106010
CV    62  RO  NORVA    0  79  NE  1  *    112177  101978  CVA
   316.83     1108.51     140.64      197.62     1345.33      436.86      122.45         .40      372.60
     0.00       29.42       5.35      655.04      812.72       39.92     1340.41        0.00        0.00   .082278   .106010
```

Unit 11 - Shop File

```
CGN   40  RA  CHASN    0  82  NE  2      50182   70182  AAN
    10.01      767.89     823.50      44.19     952.95    1935.10      18.95    2206.61     451.04     994.11
  1904.66      435.42       0.00     126.67     344.74     884.92       8.02      26.89      64.32     336.45
     0.00        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
     0.00        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00   12000    0
CGN   37  RA  NORVA    0  78  NE  2      62178   82278  AAN
    10.38      796.30     853.97      45.83     988.21    2006.70      19.65    2288.26     467.73    1030.89
  1975.14      451.53       0.00     131.35     357.50     917.67       8.32      27.89      66.70     348.90
     0.00        0.00      34.52       0.00       3.29     343.59       0.00      25.48       6.58     630.46
  1147.49        0.00       0.00    5393.05      50.14      87.13       0.00       6.58     227.69     263.86   20400   39
CGN   37  RO  NORVA    0  81  NE  1      10281   30582  AAN
    81.11     2417.86    2802.78     142.60    2296.49    6974.20    1165.60    6565.39    1696.20    7601.79
 12176.72     1950.91       0.00    2037.36    2531.11    6346.59      24.10     117.20    1869.23   23149.84
      .13     1703.48     100.86      29.37     376.61     750.66    1075.87     366.43      40.05     581.00
   813.99      216.20       0.00    2678.02     231.48     452.45        .87      14.33     139.86    3373.67   68369   14
CGN   37  RO  NORVA    0  81  NE  2  *   10281   30582  AAN
   191.98     5722.77    6633.84     337.53    5435.52   16507.25    2758.83   15539.47    4014.71   17992.51
 28820.80     4617.57       0.00    4822.18    5990.84   15021.59      57.04     277.40    4424.23   54792.81
      .30     4031.94     238.72      69.51     891.39    1776.73    2546.44     867.31      94.79    1375.16
  1926.62      511.73       0.00    6338.53     547.88    1070.89       2.06      33.92     331.02    7905.07  161821   14
CGN   37  RO  NORVA    0  82  NE  1  *   10281   30582  AAN
    56.72     1690.72    1959.89      99.72    1605.86    4876.86     815.06    4590.94    1186.09    5315.66
  8514.75     1364.20       0.00    1424.65    1769.92    4437.94      16.85      81.96    1307.08   16107.85
      .09     1191.19      70.53      20.54     263.35     524.91     752.31     256.23      28.00     406.27
   569.20      151.18       0.00    1872.64     161.86     316.38        .61      10.02      97.80    2359.09   47808   14
CGN   38  RA  NORVA    0  79  NE  2      80379  100279  AAN
     6.78      520.21     557.88      29.94     645.57    1310.94      12.83    1494.87     305.56     673.46
  1290.31      294.97       0.00      85.81     233.55     599.49       5.43      18.22      43.57     227.93
     0.00      633.11      38.46       1.33     153.86     377.12    1892.24       0.00      19.01     148.99
    56.59       92.40       0.00       0.00      76.93     326.72       0.00       6.63       2.21     595.53   11955   32
CGN   38  RA  NORVA    0  80  NE  1  *   80379  100279  AAN
      .02        1.91       2.05        .11       2.38       4.82        .05       5.50       1.12       2.48
     4.75        1.09       0.00        .32        .86       2.21        .02        .07        .16        .84
     0.00        2.33        .14        .00        .57       1.39       6.96       0.00        .07        .55
      .21         .34       0.00       0.00        .28       1.20       0.00        .02        .01       2.19      44   32
CGN   38  RO  NORVA    0  82  NE  2      70182   90283  AAN
    96.30     2870.63    3327.64     169.31    2726.55    8280.31    1383.88    7794.85    2013.84    9025.34
 14456.99     2316.25       0.00    2418.89    3005.10    7535.08      28.61     139.15    2219.27   27484.98
     0.00        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
     0.00        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00   69808    0
CV    59  RA  NORVA    0  80  NE  2      50380   72980  CVA
    16.34     2029.70     557.32     130.99    2782.41    4106.27     226.20    4628.55    2591.27    3368.28
  5301.45      997.77       0.00    1208.08    1100.34    4281.21      20.91      76.64     776.28    3394.38
     4.69     1168.45     344.83      25.70    1258.97    2024.81      19.34    4678.06      80.43    1870.65
  8240.93     1239.52       0.00    3543.05     195.87     941.97       2.17      78.62      81.94    3911.91   60000   43
CV    59  RA  NORVA    0  82  NE  1     100181   10182  CVA
    28.66     3560.89     977.76     229.80    4881.43    7203.99     396.84    8120.26    4546.08    5909.26
  9300.79     1750.47       0.00    2119.44    1930.41    7510.90      36.69     134.45    1361.90    5955.04
     0.00        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
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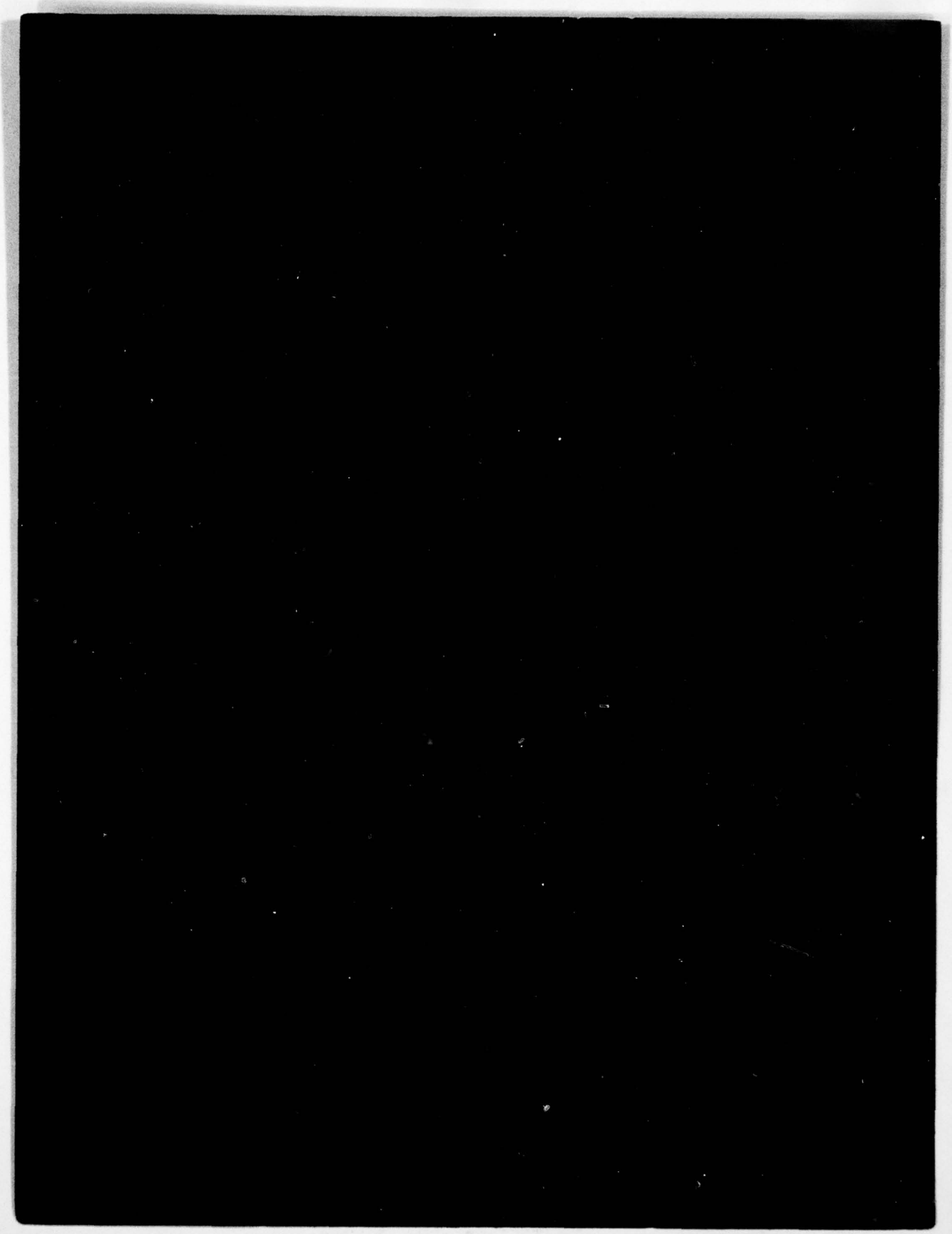
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